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**ADA TRANSPORTATION ACCESSIBILITY  
REFERENCE GUIDE**



**PROJECT ACTION  
NATIONAL EASTER SEAL SOCIETY  
&  
U.S. ARCHITECTURAL AND TRANSPORTATION  
BARRIERS COMPLIANCE BOARD**

**KRW INCORPORATED**



**NEW YORK CITY TRANSIT AUTHORITY  
OFFICE OF ADA COMPLIANCE**

**THE FIRST BARRIER TO  
UNIVERSAL DESIGN IS THE  
HUMAN MIND. IF WE COULD  
PUT A RAMP INTO THE MIND,  
THE FIRST THING DOWN THE  
RAMP WOULD BE THE  
UNDERSTANDING THAT ALL  
BARRIERS ARE THE RESULT  
OF NARROW THINKING.**

*George A. Convington*



# **ADA TRANSPORTATION ACCESSIBILITY**

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**&**

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## ACKNOWLEDGEMENT

- o Training material was prepared for the U.S. Architectural and Transportation Barriers Compliance Board.
- o Accessibility Advisory Board assisted in preparation.
- o Board included transit users who are blind, visually impaired, hearing impaired, and wheelchair dependent.
- o Each Board member identified barriers and problems they had personally encountered in the use of transportation vehicles and facilities.
- o The training is funded by Project ACTION through the National Easter Seal Society under a cooperative agreement with the U.S. Department of Transportation, Federal Transit Administration.

## **THE TRAINING OBJECTIVES. . . .**

- To explain to transportation planners, designers, operators and government officials particular application of ADAAG to fixed transportation facilities, and
- To illustrate barriers that may be encountered by persons with various disabilities using transportation vehicles and to help transportation planners, operators, and government officials develop solutions to those barriers.

# **AMERICANS WITH DISABILITIES ACT (ADA)**

## **WHY ADA. . . .**

- Some 43,000,000 Americans have one or more physical or mental disabilities, and this number is increasing;
- Historically, society has tended to isolate and segregate individuals with disabilities; and
- Persons with disabilities continue to encounter physical and communication barriers and, therefore, need special consideration.

## **PURPOSE OF ADA. . . .**

- To provide a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities;
- To provide clear, strong, consistent, enforceable standards addressing such discrimination;
- To ensure that the Federal Government plays a central role; and
- To invoke congressional authority in order to address the major areas of discrimination faced day-to-day by people with disabilities.

# ADA TITLES

TITLE I - EMPLOYMENT

TITLE II - PUBLIC SERVICES

- SUBTITLE A - GENERAL
- SUBTITLE B - PUBLIC TRANSPORTATION
- PART I - PUBLIC TRANSPORTATION OTHER THAN AIRCRAFT OR CERTAIN RAIL
- PART II - INTERCITY & COMMUTER RAIL

TITLE III - PUBLIC ACCOMMODATIONS AND SERVICES  
OPERATED BY PRIVATE ENTITIES

TITLE IV - TELECOMMUNICATIONS

TITLE V - MISCELLANEOUS PROVISIONS

The DOT Rule is concerned with implementing ADA Titles II and III.

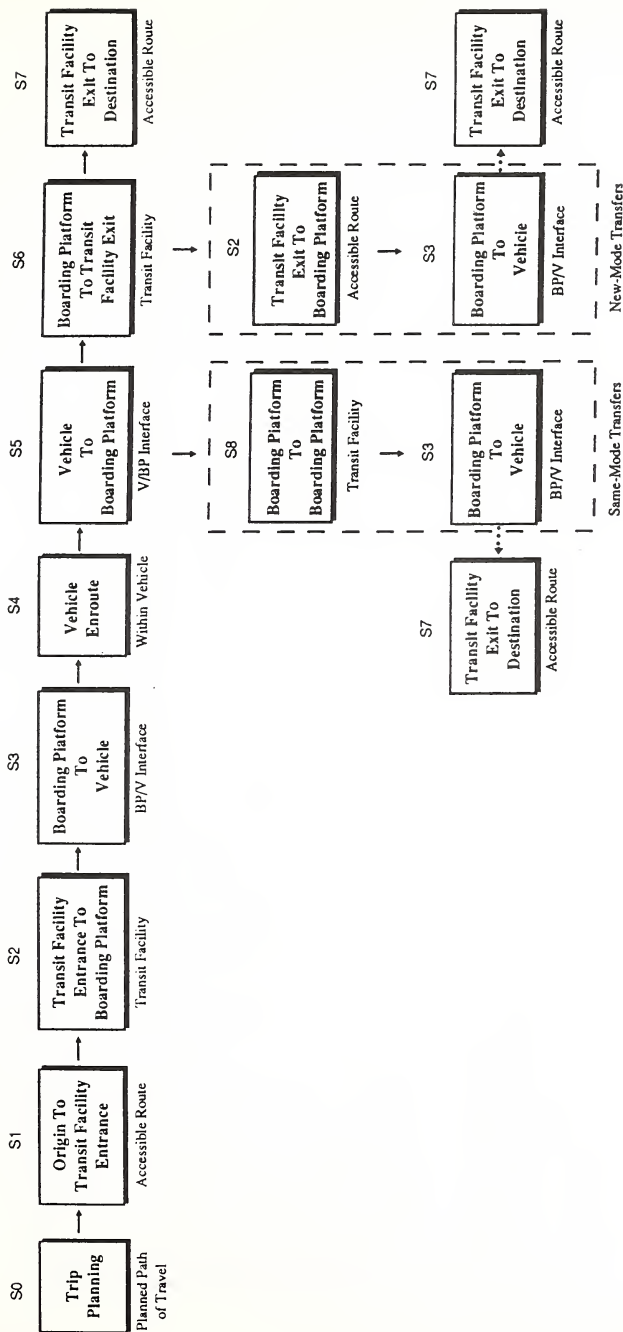


# ADA TRANSPORTATION ACCESSIBILITY

## THE PURPOSE OF THE REFERENCE GUIDE. . . . .

- To provide transportation planners, designers, operators, and government officials with a quick and comprehensive reference to the DOT Rule and the ADA Accessibility Guidelines as they apply to transit vehicles and facilities, and
- To provide a discussion of solutions to most of the problems that are encountered by persons with disabilities.

# TRIP SEGMENTS APPLICABLE TO ALL TRANSPORTATION MODES



# THE FOUR BASIC TRIP SEGMENTS

S1	S2	S3	S4
ORIGIN TO TRANSIT FACILITY ENTRANCE	TRANSIT FACILITY ENTRANCE TO BOARDING PLATFORM	BOARDING PLATFORM TO VEHICLE	VEHICLE ENROUTE
Accessible Route	Transit Facility	BP/V Interface	Within Vehicle
<ul style="list-style-type: none"> <li>o Suburban</li> <li>o Urban</li> </ul>	<ul style="list-style-type: none"> <li>o Bus Stop</li> <li>o Bus Terminal</li> <li>o Rapid Rail Station</li> <li>o Light Rail Stop</li> <li>o Light Rail Station</li> <li>o Commuter Rail Station</li> <li>o Intercity Rail Station</li> </ul>	<ul style="list-style-type: none"> <li>o Bus Stop Pad</li> <li>o Bus Terminal Platform</li> <li>o Step Entry</li> <li>o Mini-High Platform</li> <li>o High Platform</li> <li>o Mobility Aids</li> </ul>	<ul style="list-style-type: none"> <li>o Bus, Van</li> <li>o Rapid Rail Car</li> <li>o Light Rail Car</li> <li>o Commuter Rail Car</li> <li>o Intercity Rail Car</li> </ul>

## FORMAT OF A UNIT

- SCOPE
- DEFINITIONS
- LIST OF APPLICABLE STANDARDS
- PROBLEMS AND SOLUTIONS
  - CHECKLIST OF PROBLEMS
  - DISCUSSION OF PROBLEMS AND SOLUTIONS



# EXAMPLE OF HOW OVERHEADS AND TEXT INTERRELATE

Refer to Overhead 3-3

Note the following:

- Width - 36" minimum (3-9)
- Slope - 1:12 desirable; 1:8 maximum (3-9)

(3-9) Refers to the page in the text.

Go to Unit 3. Find page 3-9

This page is concerned with Curb Ramp Problems and Solutions. Note that in the Solutions, there are the following references:

Relative to Width - [4.7.3]

Relative to Slope - [4.7.2]

Numbers in [ ] refer to the DOT Rule.

Go to the Appendix in the text

4.7.3 is found on page 45669 of the DOT Rule.

4.7.2 is also found on page 45669, but contains a further reference to 4.8.2 which is found on page 45670. The latter section contains still a further reference to 4.1.6(3)(a) which is found on page 45655.

# UNIT 2

## TRIP PLANNING

### Overview

Telephone  
Written Media  
Over-the-Counter  
Training

### Telephone Access (2-4)

- TDD at Transit Information Office
- Information Clerks sensitive to needs of disabled
- Information Clerks know layout of stations, elevator locations

## **Written Media Access** (2-5)

- Maps and Schedules in large, bold type
- Braille Maps
- Reachable map/schedule cases

## **Over-the-Counter Access** (2-6)

- Accessible information/ticket stores - ramps, doors
- Counter height - 36"



## **Training** (2-7)

- Requirements apply to public and private operators
- Train to proficiency
- Appropriate to duties; technical and human relations
- Know relevant differences between disabilities

## UNIT 3

# TRIP ORIGIN TO TRANSIT FACILITY ENTRANCE

### Overview

Walkways  
Curb Ramps  
Crosswalks  
Refuge Islands  
Stairs, Ramps, Handrails  
Signage

## **Walkways** (3-3)

- Location - watch for obstacles above and adjacent to
- Width - 36" minimum
- Slope - less than 1:20
- Cross Slope - less than 1:50
- Surface - stable, firm, slip-resistant, maximum  $\frac{1}{4}$ " protrusion

## Curb Ramps

- Direction - direct traffic into crosswalk <sup>(3-7)</sup>
- Location - locate within crosswalk lines <sup>(3-7)</sup>
- Width - 36" minimum <sup>(3-9)</sup>
- Slope - new construction, 1:12 maximum <sup>(3-9)</sup>
- Slope - at existing locations:
  - 1:12 desirable
  - 1:10 to 1:8 if curb height equals 3 inches
  - 1:12 to 1:10 if curb height equals 6 inches <sup>(3-9)</sup>
- Transition - no lip, sidewalk & gutter grade maximum 1:20 <sup>(3-10)</sup>
- Side Flares - 1:10 if 48" clear at top of ramp  
1:12 if less than 48" at top of ramp <sup>(3-10)</sup>
- Surface - stable, firm, slip-resistant <sup>(3-11)</sup>
- Detectable Warning - on transit properties only\* <sup>(3-11)</sup>

\*under review by ATBCB 11/17/92

## **Crosswalks\*** (No ADAAG Standard. Use MUTCD)

- Location - where there is vehicle pedestrian conflict (3-14)
- Approach - perpendicular to curb line (3-14)
- Width - 6 ft (3-16)
- Length - coordinate with green signal time (3.5 ft/sec) (3-16)
- Markings - 6" wide, solid white (3-17)
- Surface - stable, firm, slip-resistant (3-17)

## **Refuge Island**

- Location - if pedestrians cannot cross within signal cycle (3-19)
- Placement - full view of vehicle operators (3-19)
- Shape - triangular and elongated (3-20)
- Size - 72" wide, 12 ft long, level area 48" (3-20)

**\*Guidance only**

# Stairs

(3-22)

- Not part of an accessible route (ADAAG Standards apply)
- Steps - uniform, no open risers
- Treads - 11" minimum
- Riser - 5" - 7"
- Nosing - 1½" maximum projection, 60° minimum angle
- Handrails - required on both sides

# Ramps <sup>(3-24)</sup>

- Slope - greater than 1:20 (on accessible route)
- Width - 36" minimum
- Passing Width - 60" minimum
- Edge Protection - both sides, 2" high curb
- Handrails - required both sides if ramp 6" high or 6 ft long
- Landings
  - required at bottom and top of each ramp and each ramp run
  - width - at least as wide as ramp
  - length - 60" minimum
  - size where ramps change direction - 60" x 60" minimum

Ramp Slope	Max. Rise	Max. Horizontal Length
1:12	30"	30 feet
1:16	30"	40 feet



## Handrails (3-22, 3-24)

- Mounting Height
  - stairs - 34" to 38" above step nose
  - ramps - 34" to 38" above ramp surface
- Gripping Surface -  $1\frac{1}{4}$ " to  $1\frac{1}{2}$ " diameter or equivalent
- Knuckle Clearance -  $1\frac{1}{2}$ " clear to wall
- Edges - rounded, radius  $\frac{1}{8}$ " minimum

# Signs (3-26)

- Location/Placement
  - Flat on walls
    - center of sign 60" above sidewalk
    - clear area in front of sign to approach within 3"
  - Projecting from walls
    - above 80" - overhang unlimited
    - between 27" and 80" - overhang 4" maximum
  - On posts
    - above 80" - overhang unlimited
    - between 27" and 80" - overhang 12" maximum

## **Signs (cont.)**

- Characters on Signs
  - Height
    - 5/8" for signs mounted less than 80" from floor
    - 3" for signs mounted at 80" above floor
  - Sans serif or simple serif
  - Width-to-height ratio - 3:5 to 1:1
  - Stroke width-to-height ratio - 1:5 to 1:10
  - Contrast with background - light on dark or dark on light
  - Finish - non-glare, eggshell or matte
  - Upper or upper/lower case letters
  - Space between letters - 1/16 x height of upper case letter

## **Signs (cont.)**

- Raised Characters on Signs
  - Height - 5/8" to 2"
  - Sans serif or simple serif
  - Upper case letters
  - Raised - 1/32"
  - Accompanied with Grade 2 Braille
- Pictograms
  - border height 6" minimum
  - verbal description below pictogram

## **UNIT 4-1**

# **TRANSIT FACILITY ENTRANCE TO BOARDING PLATFORM - BUS STOPS**

New construction must comply with ADA if Notice To Proceed after 1/25/92

## **Overview**

- Siting
- Layout and Placement
- Bus Stop Pads
- Bus Passenger Shelter
- Signs
- Enforcement

## Site Selection (4-1-4)

- Transit provider work closely with city traffic engineers

## Layout and Placement (4-1-4)

- Connect bus stop to accessible route
- Connect bus stop to curb
- Bus stop area should be on same slope as roadway
- Cross slope of bus stop maximum 1:50
- Watch for utility poles and guide wires\*
- Keep street furniture clear of bus stop area\*
- Watch for drainage inlets at curb\*

\*Guidance only

## **Bus Stop Pads** (4-1-5)

- Length - 96" minimum (perpendicular to curb face)
- Width - 60" minimum (parallel to roadway)
- Surface - firm and stable

## **Bus Passenger Shelters** (4-1-7)

- Width of openings - 32" minimum
- Maneuvering space at openings
  - front approach - 48" long x width of opening
  - side approach - 42" long x 54" wide (includes width of opening)
- Clear floor area - 30" x 48" minimum within shelter
- Benches - 16" - 20" from ground\*
- Location - Front of shelter 36" from curb and 36" clear distance from trees, utility poles\*

\*Guidance only

## **Bus Stop Signs** (4-1-9)

- Posts - unique; standard shape\*
- Height
  - on post - 80" to bottom of sign if sign overhang is 12" or greater
  - flat on wall - 60" to center of sign
- Character height - 3" minimum or sized to maximum dimension permitted by local codes
- Contrast - Light on dark, non-glare finish
- Character type - sans serif, simple serif
- Character proportion
  - width-to-height ratio between 3:5 and 1:1
  - stroke width-to-height ratio between 1:5 and 1:10

\*Guidance only



## **Enforcement** (4-1-11)

Work with local police to keep bus stop pull up area free of parked autos

## **UNIT 4-2**

# **TRANSIT FACILITY ENTRANCE TO BOARDING PLATFORM - BUS TERMINALS/RAIL STATIONS**

New construction must comply with ADA if NTP after 1/25/92. (Commuter rail stations - 10/7/91)

Key stations must comply with ADA by 7/26/93.

UFAS vs. ADAAG - If alterations were made prior to 1/25/92 and conformed with UFAS alterations, they are deemed accessible only to the extent a specific element is covered by the standard. Examples: (1) If an elevator conformed to UFAS, there is no need to replace it with a glazed elevator. (2) A platform edge must be modified with a tactile warning because there was no UFAS standard and now ADAAG requires it.\*

\*Under review by ATBCB 11/17/92

## Key Station Identification

- Passenger boardings exceed average station passenger boardings by at least 15%
- Transfer stations
- Major interchange points with other modes
- End stations
- Stations serving major activity centers

# Overview (4-2-12)

	New Construction	Key Stations
Entrances	One	One
Entrance Signs	Yes	Yes
Accessible Routes/Circulation Paths	Yes	Yes
Escalators	Yes	No
Elevators	Yes	Yes
Illumination	Yes	Yes
Public Address Systems	Yes	Yes
Clocks	Yes	Yes
Telephones	Yes	Yes
Fare Collection/Ticketing Areas	Yes	Yes
Platforms		
Station Identification Signs	Yes	Yes
Station, Route, Destination Signs	Yes	Yes
Platform Edge	Yes	Yes
Track Crossings	Yes	Yes

## **Entrances** (4-2-13)

- At least one accessible entrance at each new station and key station
- At least one accessible entrance to serve each fixed route or group of fixed routes
- At least one accessible entrance to commercial, retail or residential direct connections

## **Directional signage to accessible entrances** (4-2-14)

- Provide signage identifying accessible route to the accessible entrance
- Signs shall comply with ADAAG

## **Accessible Routes/Circulation Paths** (4-2-15)

- Most direct route possible
- Follow route used by general public
- Protruding objects
  - on walls
    - below 27" - any amount
    - between 27" and 80" - no more than 4"
    - above 80" - any amount
  - on posts
    - between 27" and 80" - no more than 12"

## **Direct Connections** (4-2-16)

- Leading to commercial, retail or residential facilities shall have an accessible route from the point of connection to:
  - the boarding platforms
  - all transportation system elements used by the public
- Access to future direct connections shall be on an accessible route to:
  - the boarding platforms
  - all transportation system elements used by the public

## **Escalators** (4-2-17)

- Even though not part of an accessible route, there are ADA requirements for Transit
- Where provided in below grade stations:
  - two steps must be flat at top and bottom
  - nose of each tread must be marked with 2" wide, color contrasting strip
  - clear width 32"



## **Elevators**

(4-2-18)

- Elevators in transit facilities shall have glazed or transparent panel(s) to allow unobstructed view into and out of.
- Door clear width - 36"
- Clear floor area:
  - back wall to front wall - 51"
  - back wall to closed door - 54"
  - width (door centered) - 80"
  - width (door offset) - 68" or
  - 60" diameter circle when door closed
  - alterations - 48" x 48"

## **Elevators (cont.)**

- Hall call buttons
  - mounting height - 42"
  - visual signals
  - size  $\frac{3}{4}$ ", raised or flush
  - "UP" on top, "DOWN" on bottom
  - objects below, maximum projection 4"
  
- Hall lanterns
  - visible and audible signal at each elevator door
  - one tone for up, two tones for down
  - mounting height - at least 72" or above the door
  - size -  $2\frac{1}{2}$ "
  - visible from hall call button

## **Elevators (cont.)**

- Control panel
  - locate on front wall
  - highest buttons - 54" - side approach
    - 48" - front approach
  - emergency controls at bottom of panel no lower than 35"
  - buttons, raised or flush, at least  $\frac{3}{4}$ " in smallest dimension, with visual indicator
  - raised characters,  $\frac{1}{32}$ ",  $\frac{5}{8}$ " high, sans serif and Braille to left of button
  - main floor designated by a raised star

## **Elevators (cont.)**

- Elevators and hoistway entrance characters
  - mounting height - 60" to center line of character
  - size - 2", raised 1/32", sans serif, accompanied with Braille
- Car position indicator
  - location above the door or above control panel
  - size - 1/2" high
  - visual and audible (20 decibels)
- Automatic operation
  - self leveling to within  $\pm 1/2$ " of floor

## **Elevators (cont.)**

- Door and signal timing for hall calls
  - minimum acceptable notification time - 5 seconds
- Illumination levels
  - 5 foot-candles at car controls, platform and threshold
- Door protective and reopening device
  - open and close automatically
  - sensor 5" to 29" from floor to reopen door
  - doors reopen 20 seconds
- Emergency two-way communication (if provided)
  - identify with raised symbol - 5/8" high
  - maximum 48" from floor
  - 29" cord length
  - shall not require voice communication

## **Illumination** (4-2-24)

- Provide uniform lighting
- Minimize glare on signs
- Provide sufficient lighting on entrance sign
- Avoid optical illusions (guidance only)

## **Public Address System** (4-2-26)

- When provided, must make message available to persons who are deaf

## **Clock** (when provided) (4-2-26)

- Uncluttered clock face
- Contrasting hands, numerals with background
- Mounting height - 80", numerals - 3" minimum
- Locate uniformly

## Telephones

<u>If Provided:</u>	<u># Provided</u>	<u># To Be Accessible</u>
1 or more single units		1 per floor
1 bank		1 per floor
2 or more banks		1 per bank

### Telephone Standards:

- Clear floor space of 30" X 48"
- Mounting height: 48" front approach, 54" side approach
- Protruding objects:
  - Wall mounted between 27" - 80", max. protrusion 4"
  - Post mounted between 27" - 80", max. protrusion 12"
- Volume controls: min. 12dba, max. 18dba above normal
- Hearing aid compatible
- Push button service (if avail. in area)
- Books (if provided) within standard reach ranges
- Cord at least 29" long

## **Text Telephones** (4-2-27)

- If an interior public pay phone is provided in a transit facility, then at least one interior public text phone is required.
- If four or more public pay phones serve a particular entrance to a rail station and at least one is in an interior location, then at least one interior public text phone is required to serve that entrance.
- If public pay phones are provided, all located at an exterior location, then no public text telephone is required.
- Even though public pay phones were installed and complied with UFAS, public text phones are now required under ADAAG to satisfy the above conditions.



## **Text Telephones (cont.)**

### **Text telephone standards** (4-2-28)

- permanently affixed within or adjacent to telephone enclosure
- if acoustic coupler used, cord shall be long enough to connect from text telephone to receiver
- if pay phone designed to accommodate a portable text telephone, it shall have a 6" wide shelf and electrical outlet. Shall be able to place handset flush on shelf.
- portable units can be made available. Must be available during same times as public pay phones are available.

## **Fare Collection/Ticketing Areas** (4-2-29)

- If fare media is sold over the counter:
  - sales counter must be on an accessible route
  - 36" long section of sales counter must be 36" high
- Fare gates
  - 32" clear width when open at 90 degrees
  - coin/card slot shall be within standard reach ranges
  - shall have smooth continuous surface from 2" to 27" above the floor or must operate automatically
  - maximum push/pull force 5 lbs
  - minimum gate closing time - 3 seconds from 70 degrees to 3" from latch

## **Fare Collection/Ticketing Areas (cont.)**

- One accessible fare vendor must be at each accessible entrance on an accessible route
- Automatic fare vending, collection and adjustment system standards:
  - clear floor space - 30" x 48"
  - reach range - forward approach - 15" to 48"
    - parallel approach - 9" to 54"
  - controls and operating mechanisms
    - operate with one hand, no tight grasping, pinching or twisting, 5 lbs of force
  - instructions and information for use shall be made accessible to persons with vision impairments

## **Platforms** (4-2-34)

- Board and alight from same area as general public in new stations
- All of platform or a portion thereof in key stations

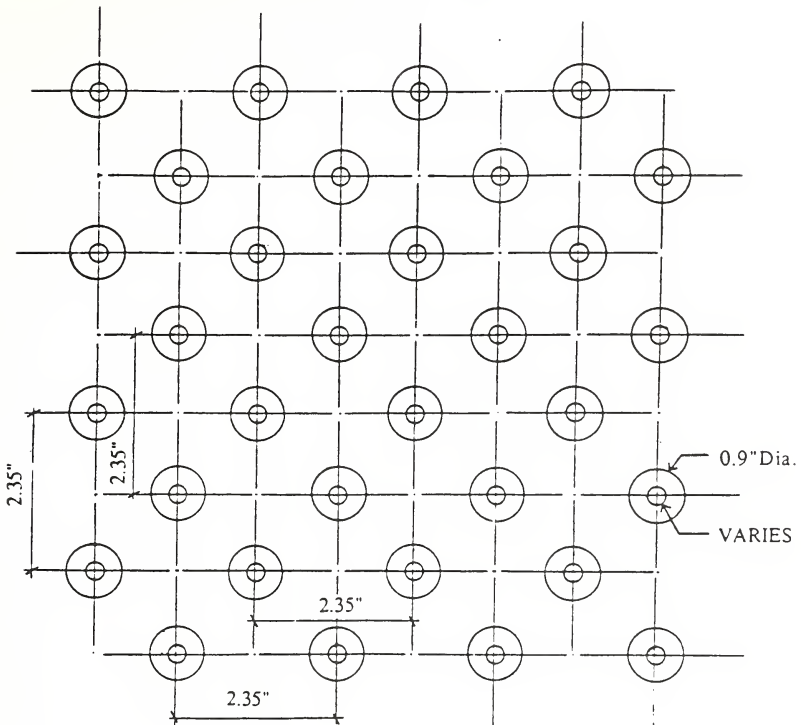
## **Destination Signs at Platforms** (4-2-36)

- Characters on signs located on the platform that list stations, routes and destinations shall comply with ADAAG.
- One station identification sign for the blind shall be placed at a uniform location on each platform.
  - mounting location - uniform location on all platforms
  - mounting height - 60" from floor to center of sign
  - clear floor space - approach to within 3" of sign

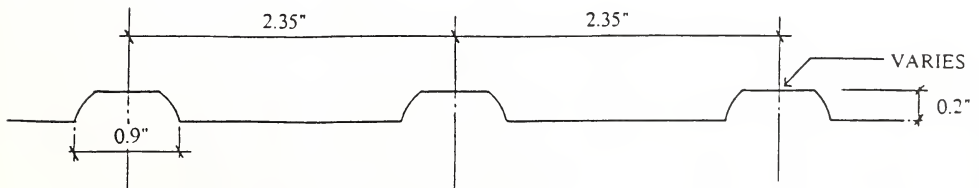
## **Platform Edge** (4-2-37)

- High level platforms shall be protected by
  - guard rail
  - platform screen
  - detectable warning surface
- Detectable warning surface (4-2-38)
  - 24" wide
  - continuous along length of platform
  - raised truncated domes, diameter - 0.9", height - 0.2", center-to-center spacing - 2.35"
  - color must contrast with platform, light on dark or dark on light
  - color must be integral part of detectable material (no paint)

# Detectable Warnings



PLAN



SECTION

## **Track Crossings** (4-2-41)

- Surface - level and flush with top or rail
- Gap at the rails -
  - inner edges of rails - maximum  $2\frac{1}{2}$ "
  - outer edges of rails - flush
- Separate walkway from tracks with:
  - curbs
  - railings, or
  - 36" wide detectable warning
- If curbs are used, curb ramps meeting the standards are required

# **UNIT 5-1**

## **ACCESSIBLE ROUTE BETWEEN PLATFORM AND THE VEHICLE (BUSES/VANS)**

### **Overview** (5-1-10)

Vehicle Destination and Route Signs  
Doors  
Steps, Thresholds and Aisles  
Lighting



## **Vehicle Destination and Route Signs** (5-1-11)

- Headsigns
  - Illuminated
  - Character proportion - width-to-height ratio - 3:5 to 1:1
  - stroke width-to-height ratio - 1:5 to 1:10
  - Space between characters -  $1/16$  x height of upper case letters
  - Contrast - dark on light, light on dark
  - Character height - minimum 2"

## Vehicle Destination and Route Signs (cont.)

- Boarding side signs
  - Illuminated
  - Character proportion - width-to-height ratio - 3:5 to 1:1
  - stroke width-to-height ratio - 1:5 to 1:10
  - Space between characters -  $1/16$  x height of upper case letters
  - Contrast - dark on light, light on dark
  - Character height - minimum 1"

## Doors

(5-1-12)

- Overhead clearance from lift platform to top of doorway
  - Buses longer than 22 feet - 68"
  - Buses 22 feet long and shorter - 56"

## **Doors (cont.)**

- Clear width
  - If lift-equipped - width of platform
  - Over-the-road bus without lift - 30" when door open (never less than 27")

## **Steps, Thresholds and Aisles** (5-1-13)

- Slip-resistant surfaces
  - steps, aisles, all walking surfaces
- Color contrast band located at:
  - step edges - full width of step
  - thresholds
  - boarding edges of ramps, lift platforms

# Lighting (5-1-14)

- At doorways
  - outside - 1 foot-candle 36" away from bus
  - stepwells - 2 foot-candles (at all times)
  - lift platform - 2 foot-candles

## **UNIT 5-2**

# **ACCESSIBLE ROUTE BETWEEN BOARDING PLATFORM AND THE VEHICLE - LEVEL BOARDING**

## **Overview - Specific Design Requirements (5-2-9)**

Between-Car Barriers

Signage

Public Information System

Coordination of Vehicle Floor with Boarding Platform

## **Between-Car Barriers** (5-2-9)

- Required where high platform, level boarding is used
  - bellows
  - pantograph gates
  - chains
  - motion detectors
  - train screens on the platform

## **Signage** (5-2-10)

- International symbol of accessibility displayed on exterior of all accessible doors unless all doors are accessible.
- Sign for accessible restroom on commuter and intercity rail car doors.

COORDINATION OF VEHICLE FLOOR WITH BOARDING PLATFORM						
SYSTEM	VEHICLE SND	ADAAG SND	VEHICLE	PLATFORM	Distance Between Platform and Vehicle Floor Measured at all Doors of all Vehicles when Vehicle is at Rest and Under Normal Passenger Load Unless Noted Otherwise	
					HORIZONTAL GAP (NOT GREATER THAN)	VERTICAL DIFFERENCE: (Within Plus or Minus)
Rapid Rail	38.53(d)	10.3.1(9)	New	New	3 in (75 mm)	5/8 in (16 mm)
Rapid Rail	38.53(d)	10.3.2(4)	New	Existing (Key Stations)	3 in (75 mm) At Key Stations at one door of each new vehicle	1 1/2 in (38 mm)
Rapid Rail	38.53(d)	----	Retrofitted	New	4 in (100 mm)	2 in (50 mm) : At 50% passenger load
Rapid Rail	38.53(d)	10.3.2(4)	Retrofitted	Existing (Key Stations)	4 in (100 mm)	2 in (50 mm) : At 50% passenger load
Light Rail	38.73(d)	10.3.1(9)	New	New	3 in (75 mm)	5/8 in (16 mm)
Light Rail	38.73(d)	10.3.2(4)	New	Existing (Key Stations)	3 in (75 mm) At Key Stations at one door of each new vehicle	1 1/2 in (38 mm)
Light Rail	38.73(d)	----	Retrofitted	New	4 in (100 mm)	2 in (50 mm) : At 50% passenger load
Light Rail	38.73(d)	10.3.2(4)	Retrofitted	Existing (Key Stations)	4 in (100 mm)	2 in (50 mm) : At 50% passenger load
Light Rail	38.73(d)	10.3.1(9)	IF NOT OPERATIONALLY OR STRUCTURALLY POSSIBLE - USE RAMP, BRIDGE, PLATF. OR PORTABLE PLATFORM OR CAR-BORNE LIFT, OR MINI-HIGH PLATFORM			

COORDINATION OF VEHICLE FLOOR WITH BOARDING PLATFORM					
SYSTEM	VEHICLE SIND	ADAAG SIND	VEHICLE	PLATFORM	Distance Between Platform and Vehicle Floor Measured at all Doors of all Vehicles when Vehicle is at Rest and Under Normal Passenger Load Unless Noted Otherwise
					HORIZONTAL GAP (NOT GREATER THAN)
Commuter Rail	38.93(d)	10.3.1(9)	New	New	3 in (75 mm)
Commuter Rail	38.93(d)	10.3.2(4)	New	Existing (Key Station)	58 in (16 mm)
Commuter Rail	38.93(d)	----	Retrofitted	New	1 1/2 in (38 mm)
Commuter Rail	38.93(d)	10.3.2 (4)	Retrofitted	Existing (Key Stations)	2 in (50 mm) - At 50% passenger load 2 in (50 mm) - At 50% passenger load
Commuter Rail	38.93(d)	10.3.1(9) 10.3.2(4)	IF NOT OPERATIONALLY OR STRUCTURALLY POSSIBLE - USE RAMP, BRIDGE, PLATE, OR PORTABLE PLATFORM OR CAR BORNE LIFT, OR MINI HIGH PLATFORM		
Intercity Rail	38.113(d)	10.3.1(9)	New	New	3 in (75 mm)
Intercity Rail	38.113(d)	----	New	Existing	58 in (16 mm)
Intercity Rail	38.113(d)	----	Retrofitted	Existing	1-1/2 in (38 mm)
Intercity Rail	38.113(d)	10.3.1(9) 10.3.2(4)	IF NOT OPERATIONALLY OR STRUCTURALLY POSSIBLE - USE RAMP, BRIDGE, PLATE, OR PORTABLE PLATFORM OR CAR BORNE LIFT, OR MINI HIGH PLATFORM		
					2 in (50 mm) - At 50% passenger load



## **Public Information Systems** (5-2-11)

- External speaker required on rapid rail vehicles that operate in stations having more than one route.

## **Coordination of Vehicle Floor with Boarding Platform** (5-2-12)

## **UNIT 5-3**

# **ACCESSIBLE ROUTE BETWEEN BOARDING PLATFORM AND THE VEHICLE - STEP ENTRY VEHICLE**

## **Overview - Specific Design Requirements** (5-3-9)

Signage

Clear Width of Passenger Doorway

Steps and Thresholds

Lighting

## **Signage** (5-3-9)

- International symbol of accessibility displayed on exterior of all accessible doors unless all doors are accessible
- Sign for accessible restroom on commuter and intercity rail car doors

## **Clear Width of Passenger Doorway at Boarding Platform** (5-3-10)

- Light rail - all doors of each vehicle - 32"
- Commuter rail - one door on each side of car - 32"
- Intercity rail - one door on each side of car - 32"

## **Steps and Thresholds** (5-3-11)

- Slip resistant
- Band of contrasting color, full width of step edge and threshold

## **Lighting** (5-3-12)

- One foot-candle on platform 36" from bottom step.  
Locate below vehicle window level.
- Two foot-candles on step, lift or ramp platform
  - if door next to driver only when door is open
  - other doors - 2 foot-candles at all times

## **UNIT 5-4**

# **ACCESSIBLE ROUTE BETWEEN BOARDING PLATFORM AND THE VEHICLE - MOBILITY AIDS ACCESSIBILITY AND SECUREMENT DEVICES**

## **Overview**

Platform Lifts  
Vehicle Ramps or Bridge Plates  
Securement Devices

## **Platform Lifts** (5-4-3)

- Design Load
- Controls
- Emergency Operation/Power
- Platform Barriers
- Platform Surface
- Platform Gaps
- Platform Entrance Ramp
- Platform Deflection
- Platform Movement/Boarding Direction
- Use by Standees
- Handrails

## **Design Load** (5-4-3)

- Lift design load 600 lbs
- Working (moving) parts - safety factor of six based on ultimate material strength
- Non-working (stationary) parts - safety factor of three based on ultimate material strength

## Controls (5-4-4)

- Controls shall be interlocked with vehicle brakes, propulsion system (rail cars), transmission (vans, buses) or door to prevent deployment when vehicle is in operation
- Momentary contact type controls - requires continuous pressure by operator or movement of vehicle when lift is deployed
- Reverse sequencing - allows raising or lowering when lift is partially through cycle



## **Emergency Operation/Power or Equipment Failure (5-4-5)**

- Emergency method of deploying lift with occupant is required
- Emergency method of stowing lift is required
- Emergency method shall not permit stowage or folding of platform when occupied

## **Platform Barriers (5-4-5)**

- Each side of platform that extends beyond vehicle shall have 1½" high barrier
- Loading (outer) edge of platform
  - sufficient to prevent power wheelchair or mobility aid from riding over it
  - must go up automatically when platform is 3" or more above ground

## **Platform Surface** (5-4-6)

- Free of protrusions over  $\frac{1}{4}$ " high
- Slip resistant
- Minimum clear width -  $28\frac{1}{2}$ " at platform surface

## **Mobility Aid Envelope** (5-4-6)

- Minimum clear width - 30" between 2" and 30" above platform surface
- Minimum clear length - 48" between 2" and 30" above platform surface

## **Platform Gaps** (5-4-6)

- Gaps between platform surface and barriers - 5/8" maximum
- Gap between vehicle floor and forward platform edge
  - horizontal 1/2" maximum
  - vertical 5/8" maximum
- Handhold gaps between platform edge barriers
  - 1 1/2" high x 4 1/2" long maximum

## **Platform Entrance Ramp** (5-4-7)

- Maximum slope 1:8 for maximum rise of 3"
- Transition between platform and ground
  - 0" to 1/4" - no treatment
  - 1/4" to 1/2" - bevel edge on 1:2 slope

## **Platform Deflection** (5-4-7)

- Maximum deflection no load to maximum load - 3 degrees on 26" x 26" test area at centroid of platform

## **Platform Movement and Boarding Direction** (5-4-8)

- Maximum speed when occupied - 6"/second
- Maximum speed when deploying or stowing - 12"/second
- Maximum vertical acceleration 0.3 g
- Boarding direction - inboard and outboard facing shall be permitted

## **Use by Standees** (5-4-8)

- Shall accommodate persons with canes, walkers, crutches

## **Handrails** (5-4-9)

- Required on both sides of platform
- Minimum length - 8"
- Height - 30" to 38"
- Strength - 100 lb point force no deformation
- Cross section - 1 $\frac{1}{4}$ " to 1 $\frac{1}{2}$ " diameter
- Edges - eased, minimum 1/8" radius
- Knuckle clearance - 1 $\frac{1}{2}$ "

# **Vehicle Ramps or Bridge Plates** (5-4-10)

- Design Load
- Surface
- Threshold
- Edge Protection
- Slope
- Attachment
- Stowage
- Handrails

## **Design Load** (5-4-10)

- Ramps or bridge plates 30" and longer shall support a 600 lb load placed at centroid distributed over an area 26" x 26"
- Safety factor of three based on ultimate material strength
- Ramps or bridge plates less than 30" long shall support a 300 lb load

## **Surface** (5-4-11)

- Slip resistant
- Continuous
- Free of protrusions over  $\frac{1}{4}$ " high
- Minimum clear width 30"
- Must accommodate 3 wheel and 4 wheel mobility aids

## **Threshold** (5-4-11)

- Transition from street to ramp and ramp to vehicle may be vertical up to  $\frac{1}{4}$ "
- If  $\frac{1}{4}$ " to  $\frac{1}{2}$ " vertical edge, bevel edge on 1:2 slope

## **Edge Protection** (5-4-11)

- Minimum 2" barrier on both edges



## **Slope** (5-4-12)

Height of Vehicle Floor	Maximum Slope
0" to 3"	1:4
3" to 6"	1:6
6" to 9"	1:8
9" to 12"	1:12
- Height of floor measurement:	
- Vans and buses - top of 6" curb to floor	
- Light, Commuter & Intercity rail cars - top of boarding platform to floor at 50% passenger load	

## **Attachment** (5-4-14)

- Ramps and bridge plates shall be attached to vehicle or platform
- Maximum horizontal gap between vehicle and ramp and platform and ramp - 5/8"

## **Stowage** (5-4-14)

- Compartment or securement system for stowed ramps or bridge plates shall be provided

## **Handrails** (5-4-15)

- Not required
- If provided:
  - shall be continuous throughout boarding process
  - height 30" to 38"
  - strength 100 lb point force no deformation
  - cross-section 1 $\frac{1}{4}$ " to 1 $\frac{1}{2}$ " diameter
  - edges eased, minimum 1/8" radius

## Securement Devices (5-4-16)

- Design Load
- Number Required and Orientation
- Movement
- Stowage
- Seat Belt & Shoulder Harness

## Design Load (5-4-16)

Vehicle Size (GVWR)	Restraining Force per securement mechanism	Restraining Force each mobility aid
30,000 lbs and greater	2,000 lb (longitudinal)	4,000 lb (longitudinal)
Up to 30,000 lbs	2,500 lb (longitudinal)	5,000 lb (longitudinal)

## Number Required and Orientation (5-4-19)

<u>Vehicle Length</u>	<u>Number Required</u>	<u>Orientation</u>
Longer than 22 ft	2	One face front
22 ft and less	1	One face front or rear

- Rear-facing securement requires padded barrier from 38" to 56" above floor, 18" wide centered in back of seated individual

## **Movement** (5-4-19)

- Maximum movement when secured - 2" any direction

## **Stowage** (5-4-19)

- When not being used securement area can be used by standees or folding seats
- Devices shall not interfere with passenger movement and shall not present a hazard
- Devices shall be reasonably vandal proof and fully accessible

## **Seat Belt and Shoulder Harness** (5-4-20)

- Each securement area shall have seat belt and shoulder harness

## **UNIT 6-1**

# **VEHICLE ENROUTE ACCESSIBILITY - BUSES/VANS**

## **General Requirements**

When do DOT Standards apply? (6-1-4)

- New & Used Vehicles (fixed route and demand responsive) - solicitation after 10/6/91
- Remanufactured Vehicles (5 years added life) - purchases, leases or does remanufacture after 8/25/90
- Existing Non-accessible Vehicles - no requirement to retrofit

## **DOT Waiver** (6-1-5)

- Requirements:
  - accessible vehicle was specified in solicitation
  - lifts could not be provided by manufacturer
  - delay in delivery of vehicles would significantly impair transit service
- Conditions:
  - waiver specific to particular bus buy
  - waiver shall include termination date (date when lifts will be available)
  - vehicles must be capable of accepting a lift

# Overview - Specific Requirements (6-1-12)

Interior circulation, handrails and stanchions  
Floors, aisles  
Securement Area  
Priority seating signs  
Public information systems  
Stop request



## **Interior Circulation, Handrails and Stanchions** (6-1-13)

On transit buses place handrails and stanchions to permit sufficient turning and maneuvering space from lift/ramp platform to the securement area

General guidelines:

- Door width\* - 32"
- Vestibule area\* - 60" diameter circle or L-shaped space with 36" wide aiseways
- Aisle widths\* - 36" or 32" at a point

\* guidance only

## **Interior Circulation, Handrails and Stanchions (cont.)**

- Specific requirements (transit buses longer than 22 ft):  
(6-1-14)
  - horizontal grab bar across front of vehicle between passenger and windshield and passenger and fare box
  - continuous overhead handrail(s) except for gap at rear door - 68" clear height
  - stanchion behind driver seat shall terminate at lower edge of aisle facing seat or have dogleg
- Handrail specifications (6-1-14)
  - cross-sectional diameter  $1\frac{1}{4}"$  to  $1\frac{1}{2}"$
  - rounded edges radius  $\frac{1}{8}"$  minimum
  - knuckle clearance  $1\frac{1}{2}"$

## **Floors and Aisles** (6-1-16)

- Slip resistant surface

## **Securement Area**

- Number
  - at least 2 on vehicles longer than 22 ft
  - at least 1 on vehicles 22 ft or less
- Location - as near accessible entrance as practicable
- Clear floor area - 30" x 48"
  - if adjoining access aisle, may overlap aisle
  - 6" of clear floor area can be under seat provided bottom of seat has 9" clear height
  - seats folded up shall not obstruct clear floor space

## **Priority Seating Signs** (6-1-17)

- Sign designating seats for persons with disabilities

## **Public Information Systems** (6-1-18)

- Public address system required on vehicles longer than 22 ft

## **Stop Request** (6-1-18)

- Stop Request required on vehicles longer than 22 ft
  - Control adjacent to securement area
  - Auditory and visual signal
  - Control height 15" to 48" above floor
  - Operate with one hand
  - No tight grasping, pinching or twisting
  - Maximum 5 lb of force to operate

# **UNIT 6-2**

## **VEHICLE ENROUTE ACCESSIBILITY - RAPID RAIL VEHICLES**

### **General Requirements**

When do DOT standards apply? (6-2-4)

- New and Used Vehicles - solicitation to purchase or lease after 10/6/91
- Remanufactured Vehicles (added life: 5 years - Rapid & Light, 10 years - Commuter & Intercity) - purchase, lease or remanufactures after 8/25/90
- Existing Non-accessible Vehicles (One-Car-Per-Train Rule) - each train (2 or more vehicles) shall have at least one car accessible by 7/25/95

# Rapid Rail Vehicles - Specific Requirements

	New Vehicles	One-Car-Per Train Rule
Accessible Door(s)	All	One with signage
Handrails & Stanchions	Yes	Yes
Floors	Yes	Yes
Priority Seating Sign	Yes	Yes
Spaces for Wheelchairs	Yes	Yes
Doorways Connecting Vehicles (if provided)	Yes	No
Public Information System	Yes	No
Door Closing Signal	Yes	No
Platform Signage from the Vehicle	Yes	Yes

## **Accessible Doors**

- One-Car-Per-Train Rule - one accessible door with signage, 32" clear width
- New Vehicles - all doors accessible, 32" clear width

## **Interior Circulation, Handrails and Stanchions** (6-2-7)

- Provide for safe boarding, on-board circulation, seating and standing assistance and alighting
  - Allow pathway at least 32" wide
  - Allow for two 48" x 30" areas for wheelchairs
- 
- Handrail Specifications (6-2-8)
    - cross-sectional diameter  $1\frac{1}{4}"$  to  $1\frac{1}{2}"$
    - rounded edges radius  $1\frac{1}{8}"$  minimum
    - knuckle clearance  $1\frac{1}{2}"$

## Floors (6-2-8)

- Slip resistant
- Carpet\*
  - attach securely
  - no pad or firm pad
  - level loop, textured loop, level cut pile
  - maximum pile thickness  $\frac{1}{2}$ "
  - edge trim maximum height  $\frac{1}{4}$ ", if greater bevel on a 1:2 slope

\*Guidance only



## **Priority Seating** (6-2-10)

- Number of seats - not specified
- Sign at each priority seat
- Characters on signs shall comply with ADAAG

## **Spaces for Wheelchairs**

- At least two per vehicle
- 30" x 48" area for each space
- Cannot unduly restrict movement of other passengers

## **Doorways Connecting Vehicles** (6-2-10)

- If connecting doors are provided on new vehicles and an aisle with 30" clear width connects wheelchair area to doorway then a 30" clear door opening is required

## **Public Information System** (6-2-11)

- Required on new vehicles
  - Interior public address system
  - External speaker on each vehicle when operating in multi-route stations

## **Door Closing Signal** (5-2-15)

- Auditory and visual warning signal required on all new vehicles

## **Platform Signage from the Vehicle** (6-2-12)

- Key stations and new stations
- Place at frequent intervals
- Center platform stations - on walls near train, station sign shall be between top and horizontal mid-line of vehicle window
- Characters on signs shall comply with ADAAG

# **UNIT 6-3 VEHICLE ENROUTE ACCESSIBILITY - LIGHT RAIL VEHICLE**

## **General Requirements**

When do DOT standards apply? (6-3-4)

- New and Used Vehicles - solicitation to purchase or lease after 10/6/91
- Remanufactured Vehicles (5 years added life) - purchase, lease or remanufactures after 8/25/90
- Existing Non-accessible Vehicles (One-Car-Per-Train Rule) - each train (2 or more vehicles) shall have at least one car accessible by 7/25/95

# Light Rail Vehicle - Specific Requirements

	New Vehicles	One-Car-Per Train Rule
Accessible Door(s)	All	One with signage
Handrails & Stanchions	Yes	Yes
Floors	Yes	Yes
Thresholds & Step Edges	Yes	No
Priority seating	Yes	Yes
Spaces for Wheelchairs	Yes	Yes
Doorways connecting vehicles (if provided)	Yes	No
Public information systems	Yes	No
Door Closing Signal	Yes	No
Platform signage from the Vehicle	Yes (New Stations)	Yes (Key Stations)

## **Accessible Doors**

- One-Car-Per-Train Rule - one accessible door with signage, 32" clear width
- New Vehicles - all doors accessible, 32" clear width

## **Interior Circulation, Handrails and Stanchions** (6-3-8)

- Provide for safe boarding, on-board circulation, seating and standing assistance and alighting
- Allow pathway at least 32" wide
- Allow for two 48" x 30" areas for wheelchairs
- Handrail Specifications (6-3-9)
  - cross-sectional diameter  $1\frac{1}{4}"$  to  $1\frac{1}{2}"$
  - rounded edges radius  $1\frac{1}{8}"$  minimum
  - knuckle clearance  $1\frac{1}{2}"$

## **Floors** (6-3-9)

- Slip resistant
- Carpet\*
  - attach securely
  - no pad or firm pad
  - level loop, textured loop, level cut pile
  - maximum pile thickness  $\frac{1}{2}$ "
  - edge trim maximum height  $\frac{1}{4}$ ", if greater bevel on a 1:2 slope

## **Thresholds and Step Edges** (6-3-10)

- Band of contrasting color at thresholds and on all step edges, full width

\*Guidance only

## **Priority Seating** (6-3-11)

- Number of seats - not specified
- Sign at each priority seat
- Characters on signs shall comply with ADAAG

## **Spaces for Wheelchairs**

- At least two per vehicle
- 30" x 48" area for each space
- Cannot unduly restrict movement of other passengers



## **Doorways Connecting Vehicles** (6-3-11)

- If connecting doors are provided on new vehicles and an aisle with 30" clear width connects wheelchair area to doorway then a 30" clear door opening is required

## **Public Information System** (6-3-12)

- Required on new vehicles
  - Interior public address system

## **Door Closing Signal** (6-2-15)

- Auditory and visual warning required on all new vehicles

## **Platform Signage from the Vehicle** (6-3-13)

- Key stations and new stations
- Place at frequent intervals
- Center platform stations - on walls near train, station sign shall be between top and horizontal mid-line of vehicle window
- Characters on signs shall comply with ADAAG

# **UNIT 6-4**

## **VEHICLE ENROUTE ACCESSIBILITY - COMMUTER RAIL CARS**

### **General Requirements**

When do DOT standards apply? (6-4-4)

- New Vehicles - solicitation to purchase or lease after 10/6/91
- Used Vehicles - solicitation to purchase or lease after 8/25/90
- Remanufactured Vehicles (10 years added life) - purchase, lease or remanufactures after 8/25/90
- Existing Non-accessible Vehicles (One-Car-Per-Train Rule) - each train shall have at least one car accessible by 7/26/95

# Commuter Rail Cars - Specific Requirements

	New Cars	One-Car-Per Train Rule
Accessible Door(s)	All Doors	One with signage
Handrails & Stanchions	Yes	No
Passageways	Yes	No
Floors	Yes	No
Thresholds & Step Edges	Yes	No
Priority Seating	Yes	No
Spaces for Wheelchairs	Yes	No
Doorways Connecting Cars (if provided)	Yes	No
Public Information Systems	Yes	No
Door Closing Signal	Yes	No
Platform Signage from the Car	Yes	Yes
Restrooms (if provided)	(New Stations) Yes	(Key Stations) Yes

## **Accessible Doors**

- One-Car-Per-Train Rule - one accessible door with signage, 32" clear width
- New Cars - all doors accessible, 32" clear width

## **Interior Circulation, Handrails and Stanchions (6-4-7)**

- When provided allow sufficient turning and maneuvering space
- Handrail Specifications (6-4-7)
  - cross-sectional diameter  $1\frac{1}{4}"$  to  $1\frac{1}{2}"$
  - rounded edges radius  $\frac{1}{8}"$  minimum
  - knuckle clearance  $1\frac{1}{2}"$

## **Passageways** (6-4-8)

- 32" minimum clear width route from accessible door to accessible seating
- 42" minimum clear width through vestibule

## **Floors** (6-4-8)

- Slip resistant
- Carpet\*
  - attach securely
  - no pad or firm pad
  - level loop, textured loop, level cut pile
  - maximum pile thickness  $\frac{1}{2}$ "
  - edge trim maximum height  $\frac{1}{4}$ ", if greater bevel on a 1:2 slope

\*Guidance only

## **Thresholds and Step Edges** (6-4-10)

- Band of contrasting color at thresholds and on all step edges, full width

## **Priority Seating** (6-4-10)

- Number of seats - not specified
- Sign at each priority seat
- Characters on signs shall comply with ADAAG

## **Spaces for Wheelchairs** (6-4-8)

- At least two per vehicle
- 48" x 30" minimum clear area for wheelchairs
- Shall adjoin accessible path
- May overlap accessible path
- May include up to 6" under adjacent seat provided adjacent seat has 9" toe clearance
- May contain fold-down or removable seats

## **Doorways Connecting Cars** (6-4-11)

- If connecting doors are provided on new cars then a 30" clear width from wheelchair area to doorway and a 30" clear door opening is required



## **Public Information System** (6-4-12)

- Interior public address system required on new cars

## **Door Closing Signal**

- Auditory and visual warning required on automatic or remote control doors on new cars

## **Platform Signage** (6-4-13)

- Key stations and new stations
- Place at frequent intervals
- Center platform stations - on walls near train, station sign shall be between top and horizontal mid-line of car window
- Characters on signs shall comply with ADAAG

## **Restrooms (If provided)** (6-4-14)

- Accessible to person in wheelchair
- Close to wheelchair seating location
- Connected to wheelchair seating location by 32" clear path
- Clear door width
  - if door at end of enclosure opposite water closet - 32"
  - if door on side of enclosure - 39"
- Door latch - operable with one hand, shall not require tight grasping, pinching, twisting of wrist
- Clear floor area
  - 35" x 60"
  - fixtures may overlap
    - 8" with 9" toe clearance
    - 19" with 29" knee clearance
  - fold-down seats and shelves may overlap

## Restrooms (cont.)

- Height of water closet - 17" to 19"
- Grab bars
  - behind water closet - 24" long
  - on one side of water closet - 12" from back wall - 40" long
  - height of grab bars - 33" to 36" above floor
- Faucets and flush controls
  - operable with one hand, shall not require tight grasping, pinching, twisting of wrist
  - maximum 5 lb of force to operate
  - mounting height 44"

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## CONSUMER ORGANIZATIONS

AARP Sights and Sounds Chapter

(214) 361-6364

American Council of the Blind

Dallas Area (214) 289-0420

Collin County (214) 517-5609

Association for the Disabled

(214) 631-6900

Blinded Veterans Association

(214) 372-7912

Council of Citizens with Low Vision  
of Texas

(214) 288-7289

Progressive Chapter of National  
Federation of the Blind of Texas

(214) 942-2612

Texas Federation of the Blind

(214) 748-3577

## RECREATION

Beep Baseball

(214) 235-6442

Disabled Sports Association  
of North Texas

(214) 352-4100

North Texas Blind Bowlers  
Association

(214) 528-7125

Youth Social/Recreation

(214) 828-9900

## HELPFUL NUMBERS

### DART

Dallas Area Rapid Transit

(214) 748-3278

HandiRides

(214) 828-6800

Disabled Persons Parking Permits

(214) 653-7621

Hadley School for the Blind

1-800-323-4238

Project LINK

(214) 969-0118

Recordings for the Blind

(512) 477-1444

Social Security Administration

1-800-234-5772

### SSI

(214) 741-3211

Texas Department of Human  
Services - Aged and Disabled

(214) 350-9711

Texas Employment Commission  
Dallas Regional Office

(214) 361-6050

Texas State Library  
Division for the Blind

1-800-252-9605

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### **AMERICAN FOUNDATION FOR THE BLIND**

Provides publications, products, public education information, and information and referral to visually impaired/blind persons and their families.  
**(214) 352-7222**

### **CL PRODUCTIONS VISUALLY IMPAIRED SERVICES LTD.**

Provides resources in braille, large print, and on cassette for persons who are visually impaired.  
**(214) 681-2771**

### **DALLAS CENTER FOR INDEPENDENT LIVING**

Provides information and referral and assistance to individuals who are both hearing and sight impaired.  
**Voice: (214) 631-6900**  
**TDD: (214) 630-5411**

### **DALLAS INDEPENDENT SCHOOL DISTRICT**

Provides educational services to blind/visually impaired and multi-handicapped children from birth through age 21.  
**(214) 490-8701**

### **DALLAS LIGHTHOUSE FOR THE BLIND, Inc.**

Provides vocational evaluation, employment opportunities, older adult services, rehabilitation training, counseling and recreation activities.  
**(214) 821-2375**

### **DALLAS SERVICES FOR VISUALLY IMPAIRED CHILDREN**

Comprehensive services to blind, visually impaired and multi-handicapped pre-schoolers, school age children, and their families.  
**(214) 828-9900**

### **EDUCATION SERVICE CENTER REGION X**

Provides supplemental services to educational programs available at local school districts for visually impaired children from birth through age 21.  
**(214) 231-6301**

### **HELEN KELLER NATIONAL CENTER FOR DEAF/BLIND YOUTHS AND ADULTS**

Provides information and referral, advocacy, consultation and other services to individuals who have visual and hearing disabilities and their families.  
**Voice and TDD: (214) 490-9677**

### **LOW VISION CLINIC**

Comprehensive vision rehabilitation services to children and adults, includes examination and training. Devices provided on a trial basis.  
**(214) 828-9900**

### **NORTH TEXAS TAPING AND RADIO FOR THE BLIND**

Information through a radio reading service and cassette recordings of printed material.  
**(214) 871-7668**

### **TEXAS CENTER FOR THE PHYSICALLY IMPAIRED**

Provides information, referral, and counseling services to persons who are physically impaired and their families.  
**(214) 240-6228**

### **TEXAS COMMISSION FOR THE BLIND**

Provides vocational rehabilitation services to adults to allow them to obtain or maintain employment. Also provides services to children, students, families, and persons who are deaf/blind.

**Voice and TDD: (214) 350-0500**

### **TEXAS SOCIETY TO PREVENT BLINDNESS**

Provides vision screenings, including glaucoma, eye safety programs and glaucoma support group.  
**(214) 528-5521**

### **VA MEDICAL CENTER/VISUAL IMPAIRMENT SERVICE**

Provides assistance and benefits to veterans who become legally blind. Rehabilitation training at a VA medical facility is also available.  
**(214) 372-7062**

### **SUPPORT GROUPS**

**Age Related Macular Degeneration**  
**(214) 363-6900**  
**1-800-451-6565**

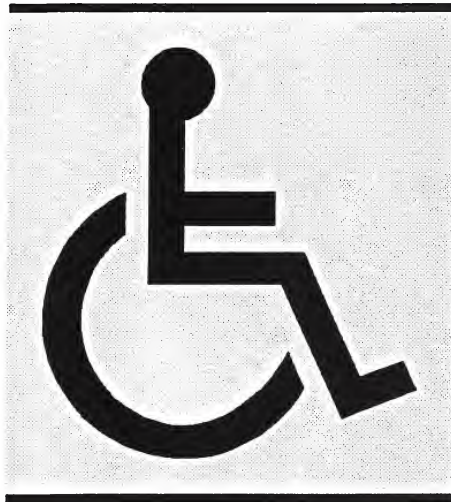
**Glaucoma**  
**(214) 528-5521**

**RP**  
**(214) 528-8880**  
**(214) 361-9595**

### **Self-Help Support Groups**

**(214) 821-2375**  
**Elderly** – Farmers Branch, Mesquite, Red Bird, and Richardson  
**Youth** – Farmers Branch

**ADA TRANSPORTATION ACCESSIBILITY  
REFERENCE GUIDE**



**PROJECT ACTION  
NATIONAL EASTER SEAL SOCIETY  
&  
U.S. ARCHITECTURAL AND TRANSPORTATION  
BARRIERS COMPLIANCE BOARD**

**KRW INCORPORATED**





# **ADA TRANSPORTATION ACCESSIBILITY**

## **TRAINING PROGRAM PREPARED FOR:**

U.S. Architectural and Transportation  
Barriers Compliance Board  
1331 F Street, N.W.  
Suite 1000  
Washington, DC 20004-1111

## **PREPARED BY:**

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This training material was prepared by KRW Incorporated under contract to the U.S. Architectural and Transportation Barriers Compliance Board. To assist in the preparation of the material, an Accessibility Advisory Board was formed by KRW. That Board included transit users who are blind, visually impaired, hearing impaired, and wheelchair dependent. Each Board member identified barriers and problems they had personally encountered in the use of transportation vehicles and facilities and participated in the documentation of accessibility barriers/problems and their solutions. These individuals provided invaluable assistance to the successful preparation of this training and resource material. The presentation of this course is funded by Project ACTION through the National Easter Seal Society under a cooperative agreement with the U.S. Department of Transportation, Federal Transit Administration.

## CONTENTS

<u>UNIT</u>	<u>TITLE</u>
1	The Total Trip: A Series of Accessible Routes
2	Trip Planning
3	Accessible Route Between Trip Origin or Destination and the Transit Facility Entrance
4-1	Accessible Route Between the Transit Facility Entrance and the Boarding Platform - Bus Stops
4-2	Accessible Route Between the Transit Facility Entrance and the Boarding Platform - Bus Terminals/Rail Stations
5-1	Accessible Route Between the Boarding Platform and the Vehicle - Buses/Vans
5-2	Accessible Route Between the Boarding Platform and the Vehicle - Rail Vehicle from a Level Boarding Platform
5-3	Accessible Route Between the Boarding Platform and the Vehicle - Step Entry Vehicle
5-4	Accessible Route Between the Boarding Platform and the Vehicle - Mobility Aids Accessibility and Securement Devices
6-1	Vehicle Enroute Accessibility - Buses/Vans
6-2	Vehicle Enroute Accessibility - Rapid Rail Vehicles
6-3	Vehicle Enroute Accessibility - Light Rail Vehicles
6-4	Vehicle Enroute Accessibility - Commuter Rail Cars
6-5	Vehicle Enroute Accessibility - Intercity Rail Cars

### **THE TRAINING OBJECTIVES. . . .**

- o To explain to transportation planners, designers, operators and government officials particular application of ADAAG to fixed transportation facilities, and
- o To illustrate barriers that may be encountered by persons with various disabilities using transportation vehicles and to help transportation planners, operators, and government officials develop solutions to those barriers.

A little less formally stated, the objective is to create an awareness, a sensitivity if you will, of the needs of persons with disabilities, of the ADAAG standards and how they are applied to help them better use transportation systems.

### **THE PURPOSE OF THE REFERENCE GUIDE. . . .**

- o To provide transportation planners, designers, operators, and government officials with a quick and comprehensive reference to the DOT Rule and the ADA Accessibility Guidelines as they apply to transit vehicles and facilities, and
- o To provide a discussion of solutions to most of the problems that are encountered by persons with disabilities.

## UNIT 1

### THE TOTAL TRIP: A SERIES OF ACCESSIBLE ROUTES

#### INTRODUCTION

Slides 1, 2

This training course is developed in a series of training units. Groups of units can be selected to simulate the various trips individuals with disabilities, including individuals who use wheelchairs, may take using the one or a combination of the various transportation system modes. The course is structured so that you, as a training participant, can simulate the trip that individuals with disabilities take. You will experience the problems and barriers the individuals who use wheelchairs and others with disabilities experience by reviewing and discussing a series of problems and solutions that may be encountered during each segment of the total trip.

To provide a uniform framework for describing an accessible "Total Trip," some consistent terminology must first be established. The total trip is defined as a series of smaller trips taken by travelers using various transportation systems between their origins and destinations. The term "systems" is particularly difficult to deal with because of the widespread and meaningful uses it enjoys. The definition of system in the next section, sets the framework for this course. Once the system has been defined, it can be broken down further into its components and elements.

The element is the key to accessibility. Barriers are generally identified and addressed at the element level. Thus, if all of the elements that make up a component are accessible, the component will be fully accessible and if all of the components of a system are accessible, the system will be accessible. Finally, if all the systems (transportation systems) used to make a particular total trip are accessible, then individuals with disabilities, including individuals who use wheelchairs, will be able to make their total trips free of barriers.

The next section, "Definitions," establishes a uniform framework for describing the features one encounters during the total trip. Once a uniform framework has been established, the following section, the "Total Trip Concept," explains how a total trip is nothing more than a series of accessible routes between a defined origin and destination.

#### DEFINITIONS

**SYSTEM:** A SYSTEM is the entire transportation system in a specific geographic area. The total system is composed of various transportation subsystems. Examples include the highway/roadway system, a pedestrian walkway system, a parking lot system, single-mode transportation systems such as fixed route bus systems; rapid, light, commuter, and intercity rail systems; over-the-road bus systems; van and small bus systems; and other transportation systems. Mixtures of these modes are common and the largest multimodal SYSTEMS can, in effect, be made up of all of these individual transportation systems.

An alternate definition of a system, from the traveler's perspective, is a continuous route connecting the traveler's origination and destination points. An entire transportation system consists of the totality of the systems (i.e., routes) that travelers might use. A person with a disability is much more interested in the specific system he or she will use on a given trip. System failure (nonaccessibility) usually occurs because of a lack of continuity between the components and elements of the system.

**COMPONENTS:** A component is a major part of a transportation system. Such major system parts are grouped into route components, vehicle components and facility components. For either definition of system given above, it is seen that each is a particular combination of route, vehicle and facility components. Analysis of system and component accessibility entails examination of all vehicle/facility interfaces for accessibility in addition to that for each route, vehicle and facility component. Buses of all sizes, various rail vehicles, etc., are examples of vehicle components. Facility components include bus stops, bus terminals, transit stations, etc. Route components include the path of travel from home to a transit stop or facility, the path through the vehicle or the facility, etc.

**ELEMENTS:** An element is a constituent part of a component. The elements of a bus include the bus lift, signs, aisle width, handrails and stanchions, securement device, door, etc. Examples of transit station elements are ramps, signs, elevators, doors and gates, stairs and escalators, tactile warnings, platform/train interfaces, etc. Elements of a route include curb ramps, crosswalks, street furniture, etc.

**SINGLE-MODE SYSTEMS:** Specific single-mode mass transportation systems are defined in the DOT Final Rule. Such systems include fixed route systems: bus, rapid rail, light rail, commuter rail, demand responsive systems, paratransit systems and vanpools. The definitions of these systems given in the DOT Final Rule are presented in the Appendices.

**VEHICLES:** Specific mass transportation vehicles are also defined in the DOT Final Rule including bus, light and heavy rail vehicles, over-the-road buses, commuter rail car, intercity rail passenger car, new/used/remanufactured vehicles and other vehicles. The vehicle definitions are presented in the Appendices as given in the DOT Final Rule.

**FACILITY:** All or any portion of buildings, structures, site improvements, complexes, equipment, roads, walks, passageways, parking lots, or other real or personal property located on a site.

**ACCESSIBLE ROUTE:** A continuous unobstructed path connecting all accessible elements and spaces in a building or facility. Interior accessible routes may include corridors, floors, ramps, elevators, lifts, and clear floor space at fixtures. Exterior accessible routes may include parking access aisles, curb ramps, walks, ramps and lifts.

**ACCESSIBLE VEHICLE:** A transportation vehicle shall be considered readily accessible to and usable by individuals with disabilities if it meets the requirements of Part 37, Transportation Services for Individuals with Disabilities (ADA), and the standards of Part 38, ADA Accessibility Specifications for Transportation Vehicles, of the 1991 DOT Final Rule.

**SITE:** A parcel of land bounded by a property line or a designated portion of a public right-of-way.

**ACCESSIBLE FACILITY:** A transportation facility shall be considered readily accessible to and usable by individuals with disabilities if it meets the requirements of Part 37, Transportation Services for Individuals with Disabilities (ADA) and the standards of Appendix A of Part 37 of the 1991 DOT Final Rule.

## THE TOTAL TRIP CONCEPT

### Slide 3

The total trip -- from a traveler's perspective -- is a series of trip segments which when connected form a continuous route between the traveler's origin and destination. Because of their barrier-avoidance needs, persons with disabilities must research and determine the feasibility of each specific segment they plan to use in traveling from one place to another.

Exhibit 1 illustrates the typical trip segments which comprise a total trip. Travelers with disabilities first plan and, where a planned trip is feasible for them, proceed from origin to destination via these well-defined trip segments. The nomenclature for the trip segments is as follows:

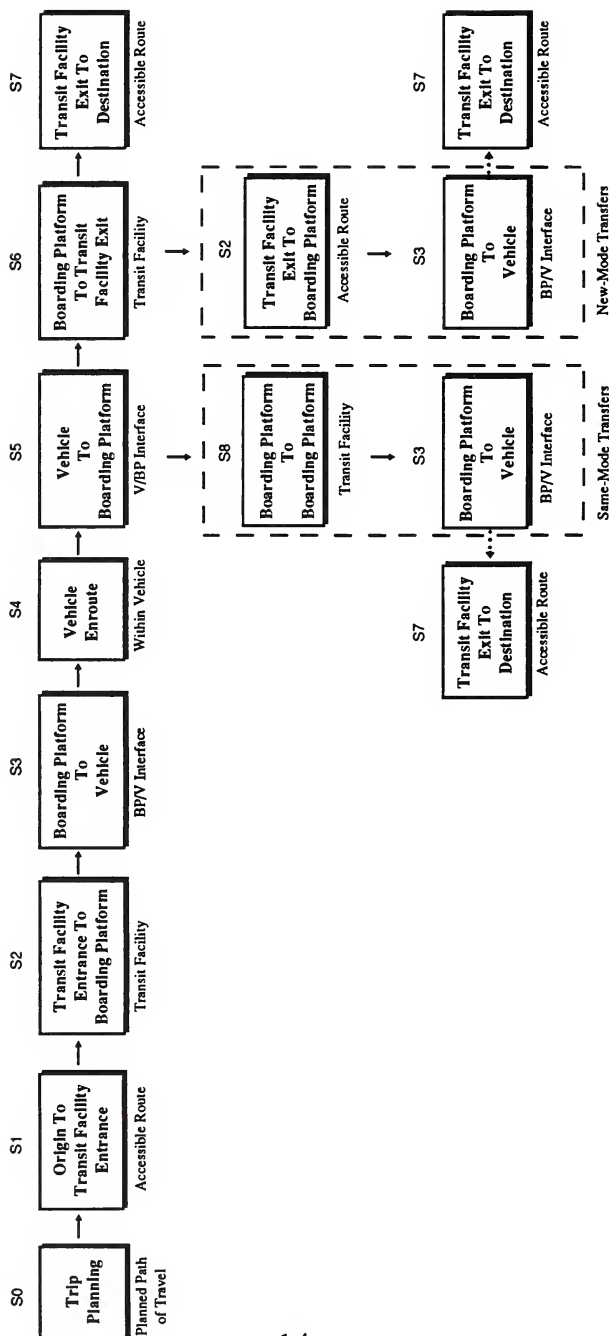
- S0: Trip Planning
- S1: Origin to Transit Facility Entrance
- S2: Transit Facility Entrance to Boarding Platform
- S3: Boarding Platform to Vehicle
- S4: Vehicle Enroute
- S5: Vehicle to Boarding Platform
- S6: Boarding Platform to Transit Facility Exit
- S7: Transit Facility Exit to Destination
- S8: Boarding Platform to Boarding Platform

This nomenclature describes each trip segment by its beginning and endpoint of travel. Each type of trip segment is displayed as a rectangle in the exhibit. The path of travel followed during each trip segment is shown just below each rectangle. For example, the path of travel for segment S1 is the accessible route that a person with disabilities would take between his or her home and the transit facility entrance. If the transportation mode were a fixed route bus system, the transit facility entrance would be the point where the person passes the property line of the bus stop area. The same point of property-line passage definition of entrance would apply to rail systems, however the corresponding S2 segments for a bus stop and a rail station are considerably different. More explicitly, for a bus mode, the S2 path of travel would be a short path within the bus pad area. For a rail mode, the S2 path of travel would be a much longer, possibly multilevel, path within the rail system transit facility. The path of travel shown in Exhibit 1 for each of the remaining trip segments are self explanatory and helpful in visualizing potential barriers/problems in "negotiating" each path.

The most critical trip segment is S0, Trip Planning. Here, the persons with disabilities must use the telephone, system maps, advice of others familiar with the system's



EXHIBIT 1: TRIP SEGMENTS APPLICABLE TO ALL TRANSPORTATION MODES



barriers/problems, and other aids to assess the feasibility of the trip. Ascertaining feasibility requires anticipating the barriers that the trip will present and "mentally" overcoming them beforehand. Only when feasibility is firmly established can travelers with disabilities begin the trip.

From Exhibit 1, it is seen that trip segments S1 through S7 would be taken by travelers on any single-mode trips not involving transfers to other vehicles or other modes. As outlined with dotted lines in the exhibit, same-mode transfers are initiated by trip segment S8, wherein the path of travel is within the transit facility and proceeds from one boarding platform to another. Thereafter, as shown in the exhibit, the single mode trip would be completed via trip segments S3 through S7. If other transfers were made, they would be initiated by a trip segment S8 at the transfer point. Appropriate use of trip segments S1 through S8 as illustrated by this single-mode with-transfer(s) trip can be used to describe, and plan in detail, any "total trip." This illustrates the generic nature of the trip segments and the straightforward building block approach to transportation trip planning that travelers with disabilities must thoroughly complete.

This building block approach applies equally well to inter-mode transfers, also outlined with dotted lines in Exhibit 1. These transfers would be initiated after leaving the platform and traveling to the exit of one modal facility (trip segment S6) and proceeding along a route from the entrance to the boarding platform of the second modal facility (Segment S2) followed by boarding the second mode vehicle (Segment S3) to complete the transfer. Thereafter, the traveler would continue via segments S3 through S7 to complete the trip on the new mode. Should other transfers be required before trip end, they would be initiated either by a same-mode segment, S8, or a new-mode segment, S2, and proceed as explained above.

This training program has been developed to enable the participant to simulate a total trip using various transportation systems. The training program has been developed in a series of units which correspond to the basic trip segments which make up a total trip.

The number of trip segments for which training units are presented has been narrowed down to the first four: S1, S2, S3, and S4. Note that S5 and S3 are both passages between a boarding platform and a vehicle, one leaving (S5) and the other boarding (S3). The barriers associated with either of these trip segments are presented in the same training unit. This also applies to the two other mirror-image pairs of transit segments: S6 and S2, and S7 and S1. Finally, S8 is essentially an S2, both of which involve passage within a transit facility.

#### Slide 4

Exhibit 2, The Four Basic Trip Segments, summarizes the abbreviated version of the more detailed total trip. For each of the four basic trip segments, the exhibit shows various combinations of transportation systems and components that might be used during that segment of the trip. The exhibit includes most of the available means of transportation in urban or suburban areas within the United States. With the addition of the Trip Planning segment mentioned earlier, a total trip - single-mode or multi-mode - origin to destination

EXHIBIT 2: THE FOUR BASIC TRIP SEGMENTS

S1	S2	S3	S4
ORIGIN TO TRANSIT FACILITY ENTRANCE	TRANSIT FACILITY ENTRANCE TO BOARDING PLATFORM	BOARDING PLATFORM TO VEHICLE	VEHICLE ENROUTE
Accessible Route	Transit Facility	BP/V Interface	Within Vehicle
<ul style="list-style-type: none"> <li>o Suburban</li> <li>o Urban</li> </ul>	<ul style="list-style-type: none"> <li>o Bus Stop</li> <li>o Bus Terminal</li> <li>o Rapid Rail Station</li> <li>o Light Rail Stop</li> <li>o Light Rail Station</li> <li>o Commuter Rail Station</li> <li>o Intercity Rail Station</li> </ul>	<ul style="list-style-type: none"> <li>o Bus Stop Pad</li> <li>o Bus Terminal Platform</li> <li>o Step Entry</li> <li>o Mini-High Platform</li> <li>o High Platform</li> <li>o Mobility Aids</li> </ul>	<ul style="list-style-type: none"> <li>o Bus, Van</li> <li>o Rapid Rail Car</li> <li>o Light Rail Car</li> <li>o Commuter Rail Car</li> <li>o Intercity Rail Car</li> </ul>

can be simulated by using combinations of these basic trip segments.

The following training materials have been developed to address the problems/barriers individuals with disabilities, including individuals who use wheelchairs, encounter when taking a total trip. You can make up the trip of your choice and put your own training course together by simply selecting the appropriate training units for that trip.

#### Slide 5

For ease of reference, Exhibit 3 provides a listing of the course unit numbers that apply to each of the four basic trip segments. Unit 2 in these course materials addresses the barriers that may be encountered during the trip planning phase.

An example of how to assemble the course materials for a typical home-to-work trip follows. The activities in the left column describe each segment of the trip. The corresponding course unit number and title are presented in the right column. Note that some of the units are listed at the start of the total trip and again toward the end of the total trip (e.g., Units 3 and 4-2). For this example, the titles of those units have been changed slightly to represent a particular trip segment. Even though these title changes have been made here to illustrate a point, the basic Unit contained in the course material addresses all of the barriers that may be encountered during these trip segments regardless if one travels from an entrance to a platform or from a platform to an exit within that particular type of transportation facility.

#### TRIP SEGMENT DESCRIPTION

#### COURSE UNIT NUMBER AND TITLE

Plan your trip	Unit 2 Trip Planning
Travel to the Bus Stop	Unit 3 Accessible Route Between Trip Origin and the Transit Facility Entrance
At the Bus Stop	Unit 4-1 Accessible Route Between the Transit Facility Entrance and the Boarding Platform - Bus Stops
Getting on the Bus	Unit 5-1 Accessible Route Between the Boarding Platform and the Vehicle - Buses/Vans
Riding on the Bus	Unit 5-4 Mobility Aids and Securement Devices
Transfer to Rapid Rail	Unit 6-1 Vehicle Enroute Accessibility - Buses/Vans
At the Platform	Unit 4-2 Accessible Route Between The Transit Facility Entrance and The Boarding Platform - Bus Terminals/Rail Stations
Riding on the Rapid Rail Vehicle	Unit 5-2 Accessible Route Between the Boarding Platform and the Vehicle - Rail Vehicle Level Boarding Platform
	Unit 6-2 Vehicle Enroute Accessibility - Rapid Rail Vehicles

From the Platform to  
the Street  
From the Street to your  
Office

Unit 4-2 Accessible Route Between the  
Boarding Platform and Transit Facility Exit  
Unit 3 Accessible Route Between Transit  
Facility Exit and Destination

# EXHIBIT 3: TRAINING UNIT CORRELATION TO THE FOUR BASIC TRIP SEGMENTS

S1	S2	S3	S4
ORIGIN TO TRANSIT FACILITY ENTRANCE	TRANSIT FACILITY ENTRANCE TO BOARDING PLATFORM	BOARDING PLATFORM TO VEHICLE	VEHICLE ENROUTE
Accessible Route	Transit Facility	BP/V Interface	Within Vehicle
<ul style="list-style-type: none"> <li>o Suburban</li> <li>o Urban</li> </ul>	<ul style="list-style-type: none"> <li>o Bus Stop</li> <li>o Bus Terminal</li> <li>o Rapid Rail Station</li> <li>o Light Rail Stop</li> <li>o Light Rail Station</li> <li>o Commuter Rail Station</li> <li>o Intercity Rail Station</li> </ul>	<ul style="list-style-type: none"> <li>o Bus Stop Pad</li> <li>o Bus Terminal Platform</li> <li>o Step Entry</li> <li>o Mini-High Platform</li> <li>o High Platform</li> <li>o Mobility Aids</li> </ul>	<ul style="list-style-type: none"> <li>o Bus, Van</li> <li>o Rapid Rail Car</li> <li>o Light Rail Car</li> <li>o Commuter Rail Car</li> <li>o Intercity Rail Car</li> </ul>
UNIT 3	UNIT 4-1 UNIT 4-2	UNIT 5-1 UNIT 5-2 UNIT 5-3 UNIT 5-4	UNIT 6-1 UNIT 6-2 UNIT 6-3 UNIT 6-4 UNIT 6-5



## UNIT 2

### TRIP PLANNING

#### SCOPE

Prior to embarking on a trip, persons with different disabilities will ask different questions about the planned trip. Each will pursue different aspects of some questions in great depth, depending on the nature of his or her disability. In the main, all will ask various forms of the following questions:

#### Slide 1      Q1: Can Your System Get Me There?

This question inquires not only about the geographical extent of the system and its on-the-system accessibility, but also asks about the proximity of the traveler's origin and destination point to the system, hours of operation, etc. If any of these general characteristics of the system fail to meet the needs of the user, he or she will not even attempt to use the system and will ask no further questions. Most persons with disabilities will pose Question 1 and the succeeding questions to the transit agency first. For increased assurance of feasibility, they will ask these questions again of friends and others who may have the same disabilities.

#### Q2: Tell Me About the Entry and Exit Points?

This question addresses the exact location, and accessibility provisions, of the entry and exit points of the system. Note that this question must also be asked by those in the general public who are unfamiliar with the system. Hence, the extent to which the requested information is available to the general public largely determines the extent of the barriers perceived by potential first time users. This entry/exit information is crucial to blind and low vision travelers who often conduct a pre-trip "practice run" to at least the entry point.

#### Q3: Wayfinding, which requires a host of questions about:

- Getting on the bus, rail car, other vehicles.
- Getting through terminals and stations.
- Gaining status awareness (announcements, signage, lighting, elevation changes, elevator control panels, escalator locations).
- Transfer points and other vehicle/facility interfaces.
- Leaving the system, including where to exit vehicle, when (i.e., how to anticipate?), and where (i.e., the characteristics of the exit point from the system-side).



## DEFINITIONS

### Slide 2

**Text Telephone:** Machinery or equipment that employs interactive graphic (i.e., typed) communications through the transmission of coded signals across the standard telephone network. Text telephones can include, for example, devices known as TDD's (telecommunications display devices or telecommunication devices for deaf persons) or computers. The operand word is "interactive", meaning the ability to conduct a real-time, two-way conversation.

**Braille:** A system of writing for blind persons that uses characters made up of raised dots.

**Braille Writer:** A machine for writing Braille.

**Braille Alphabet:**

a	b	c	d	e	f	g	h	i	j
1	2	3	4	5	6	7	8	9	0
⠁	⠃	⠉	⠇	⠑	⠋	⠏	⠒	⠑	⠚
k	l	m	n	o	p	q	r	s	t
⠅	⠇	⠍	⠏	⠕	⠎	⠖	⠓	⠔	⠞
u	v	w	x	y	z	Capital Sign	Numeral Sign		
⠠	⠡	⠠	⠠	⠠	⠠	⠠	⠠		

braille alphabet

**Pictograms:** One of the symbols belonging to a pictorial graphic system, a pictograph.

### Slide 3

**Sans serif:** A letter or type face with no serifs. Serifs are any of the short lines stemming from and at an angle to the upper and lower ends of the strokes of a letter.

**Deal tray:** A drawer-like tray used to distribute articles from a secured area to an unsecured area. Commonly used at drive-up windows at banks.

## APPLICABLE STANDARDS

Space Allowance and Reach Ranges	ADAAG 4.2
Accessible Route	ADAAG 4.3
Doors	ADAAG 4.13
Storage	ADAAG 4.25
Controls and Operating Mechanisms	ADAAG 4.27
Signage	ADAAG 4.30
Telephones	ADAAG 4.31
Fixed or Built-in Seating and Tables	ADAAG 4.32
Automated Teller Machines	ADAAG 4.34
Sales and Service Counters, Teller Windows, Information Counters	ADAAG 7.2
Fixed Facilities and Stations	ADAAG 10.3; 10.3.1(18)

## PROBLEMS AND SOLUTIONS

Information on transit system accessibility can be delivered in various ways. Each method of delivering the information poses special problems to the transit agency and the people with various types of disabilities. System information presented in such a way that it is accessible to a person who is blind may not meet the needs of a person who is deaf. Thus, information regarding the accessibility of a transit system must be developed recognizing the relevant differences between disabilities (e.g., mobility, vision, hearing or cognitive impairments).

The following problems and solutions address those differences for three methods of access to the information, namely: telephone, written media and over-the-counter access. Some of the following can be applied to existing services whereas, for new construction and alterations, the standards in Appendix A (ADAAG) to Part 37 are mandatory. The last set of problems and solutions addresses training requirements.

### Check List of Problems

- ☐ Telephone Access
- ☐ Written Media Access
- ☐ Over-the-Counter Access
- ☐ Training

☐ **Telephone Access**

**Problem:** People who have hearing disabilities cannot obtain information about the transit system over the standard telephone.

Slide 4 **Solution:** Transit agency information offices must provide information in accessible formats. Therefore, they should have text telephones available and should staff each shift with a person who knows how to use the text telephone. Another option for transit agencies is to utilize a text telephone service agency. This allows people with hearing disabilities to call the text telephone service agency and correspond with a person who is skilled in the use of the text telephone. The service agency then relays the message via a voice phone to the transit agency.

**Problem:** People who are visually impaired or blind and want to travel by public transit must be able to obtain detailed directions over the telephone about how to get to and use the transit system.

Slide 5 **Solution:** Transit information clerks must be sensitive to the needs of visually impaired or blind people and be able to provide very specific directions. Transit information clerks must have the information available to them (e.g., maps and transit facility layouts) so that they can refer to those materials when giving directions.

**Problem:** People with walking disabilities want to know if the transit stations they want to use are accessible by elevator when they call for information. They would also like to know if the route between their origin and the transit facility and between the transit facility and their destination is accessible.

**Solution:** Transit Agency information clerks should have the appropriate maps and floor plans of the transit facilities available so that they can locate and give directions to the accessible routes within the various transit facilities. Local governments should have mapping showing which intersections have curb ramps and which streets have accessible walkways for people in wheelchairs.

☐ **Written Media Access**

**Problem:** People with vision impairments cannot read the maps or transit schedules published by the transit providers.

- Slide **Solution:** Transit system route maps can be printed in Braille for those people who  
6 are blind and can understand Braille. For people with limited sight, maps and route  
schedules could be printed in large bold typeface or the transit service provider  
Slide could, upon request, enlarge specifically requested maps and route schedules by  
7 simply expanding the existing schedule on a copy machine.

**Problem:** The counters, shelves, and "pocket boards" where route schedules are distributed are not accessible to people who use wheelchairs.

- Slide **Solution:** Counters, shelves, and pocket boards that are built and installed by the  
8 transit provider should be constructed and installed in such a way that a person in  
a wheelchair can reach the schedule. Section 4.2 of the ADAAG Standards contain  
Space and Reach Ranges which should be followed when installing "pocket boards"  
on walls for the distribution of route schedules and when installing counters and  
shelves where written media is distributed. Service counters are covered by Section  
7.2, in new construction and alterations. [4.2.5, 4.2.6]

**Problem:** Large system maps are sometimes mounted too high on the wall or  
mounted horizontally on a pedestal which is too high for people in wheelchairs to  
see.

- Slide **Solution:** Maps that are mounted on the walls should be located so that a person  
9 in a wheelchair can approach within 3 in (76 mm) of the map without encountering  
protruding objects. The map should be mounted so that its centerline is no more  
than 60 in (1525 mm) above the floor. When a map is located on a pedestal or  
platform, it should be placed on an angle with the floor (tilted) and mounted low  
enough so a person in a wheelchair can view the entire map. [4.30.6]

**Problem:** Maps are often placed behind plexiglass to protect them from vandalism.  
Lighting over the map causes a glare making it difficult for persons with visual  
impairments to read.

- Slide **Solution:** If a plexiglass type cover must be used, a non-glare surface should be  
10 considered or the lighting for the map should be positioned in such a way so there  
is no glare on the plexiglass cover. The amount of glare may be different for a  
standing person as opposed to a person sitting in a wheelchair. [4.30.5]

☐ **Over-the-Counter Access**

**Problem:** Information or ticket booths or stores are not accessible to persons in wheelchairs.

**Solution:** When a transit agency provides a ticketing and information service, it must be designed to accommodate people in wheelchairs. Applicable ADAAG Standards must be followed for entrances, doors, aisle widths, protruding objects, ground and floor surfaces, and signage. Most importantly, the store or booth must be on an accessible route. For existing facilities which are not key stations, general "program access" requirements apply. [4.14, 4.13, 4.3, 4.4, 4.5]

**Problem:** Even though the information store or booth is accessible once in the store or to the booth, the service counter is too high for people in wheelchairs.

Slides 11, 12 **Solution:** An auxiliary counter with a maximum height of 36 in (915 mm) in close proximity to the main counter should be provided so that people in wheelchairs can transact business with the ticket or information clerk. [7.2(2), 10.3.1(18)]

**Problem:** Information/ticket clerks cannot communicate with people who are deaf.

**Solution:** The transit provider should have a TDD available at the information/ticket store. At least one clerk per shift should know how to operate the TDD. If a TDD is not available, the clerk should use a note pad. Messages should be written in large bold strokes so that if the person also has visual impairments, the message can be seen. The transit agency should provide sensitivity training to all information clerks so that they can better understand and deal with the various disabilities.

**Problem:** Many ticketing areas have a thick glass screen between the ticket agent and the public. Window slots or deal trays are used to transact business. Many times the lighting on the window causes a glare and the person in a wheelchair cannot see the ticket agent. The window slot or deal trays are often too high for a person in a wheelchair to reach.

**Solution:** Care should be taken when designing the glass screen. A non-glare glass can be used or the lighting should be located so there is no glare. When window slots and deal trays are used and cannot be placed at a height that is accessible to people in wheelchairs, a separate auxiliary counter can provide equivalent facilitation under some circumstances. The auxiliary counter must be a maximum height of 36 in (915 mm). [10.3.1(18), 7.2(2)]

## ☐ Training

**Problem:** The transit agency workforce that deals directly with the public, either across the counter or over the telephone, and those who design and distribute the written information about transit service are not sensitive to the needs, and do not know how to deal with persons with various disabilities.

**Solution:** The Department of Transportation Final Rule on Transportation for Individuals with Disabilities, Section 37.173 Training, emphasizes several points: First, the requirements for training apply to private as well as to public providers of transit. Second, training must be to proficiency. That is, every employee who is involved in the delivery of transit service to persons with disabilities must have been trained so that he or she knows what needs to be done to provide service in the right way. Third, training must be appropriate to the duties of each employee. An information clerk must be trained to be sensitive and provide adequate information to persons with various disabilities. Fourth, the training requirement applies to both technical tasks and human relations. Employees must know how to operate equipment (e.g., text telephone) and every employee who has public contact has to understand the necessity of treating individuals with disabilities courteously and respectfully. Finally, one of the important points in training concerns differences among individuals with disabilities. All individuals with disabilities are not alike. Recognizing the relevant differences between disabilities (e.g., mobility, vision, hearing or cognitive impairments) and responding to them is extremely important. [37.173]

## **EXERCISES**

1. What is a TDD?
2. What is the preferred type of print for accessible signage?
3. If a transit map is mounted on a wall, how high off the floor should it be?
4. How high should a ticket counter be to ensure that it is accessible to individuals who use wheelchairs?
5. Is a public transit agency required to train its employees who deal with persons with disabilities?

UNIT 3  
ACCESSIBLE ROUTE BETWEEN TRIP ORIGIN OR DESTINATION  
AND THE TRANSIT FACILITY ENTRANCE

**SCOPE**

The Department of Transportation rules implementing the facility accessibility requirements of ADA can be found in Appendix A of 49 CFR Part 37, the ADA Accessibility Guidelines for Buildings and Facilities.

This training unit will address the various accessible elements one encounters when traveling from the origin of the trip to the transit facility entrance or from the transit facility exit to the trip destination.

The accessible elements that will be addressed are:

- Walkways and Sidewalks
- Curb Ramps
- Crosswalks
- Refuge Islands
- Stairs, Ramps and Handrails
- Signage

A section for each of the above accessible elements follows which provides key definitions, applicable standards, and a series of problems and solutions.



## **WALKWAYS AND SIDEWALKS**

### **DEFINITIONS**

**Walkway or walk:** An exterior pathway with a prepared surface intended for pedestrian use, including general pedestrian areas such as plazas and courts.

**Sidewalk:** A walkway within a public right-of-way.

**Accessible Route:** A continuous unobstructed path connecting all accessible elements and spaces of a building or facility. Interior accessible routes may include corridors, floors, ramps, elevators, lifts, and clear floor space at fixtures. Exterior accessible routes may include parking access aisles, curb ramps, crosswalks at vehicular ways, walks, ramps, and lifts.

**Note:** Elements and spaces located on a site and required to be accessible must be connected with an Accessible Route. Elements and spaces on different sites may or may not be connected by a walkway or walk which meets the requirements for an Accessible Route. Most of the facilities discussed in this unit will have been built prior to the effective date of ADAAG or by an entity not yet subject to it. Nevertheless, the standards for an Accessible Route (ADAAG 4.3) can be used to evaluate the accessibility and useability of any walkway or walk.

### **APPLICABLE STANDARDS**

Width	ADAAG 4.3.3
Passing Space	ADAAG 4.3.4
Head Room	ADAAG 4.3.5, 4.4.2
Surface Texture	ADAAG 4.3.6, 4.5.1
Changes in Level	ADAAG 4.3.8, 4.5.2
Gratings	ADAAG 4.5.4
Slope	ADAAG 4.3.7
Detectable Warnings	ADAAG 4.29

## PROBLEMS AND SOLUTIONS

This section will discuss some of the typical general design problems associated with the layout and placement of a walkway. Typical specific design issues will be presented.

### Checklist of Problems

- ☐ Walkway Location and Placement
- ☐ Walkway Width
- ☐ Walkway Slope and Cross Slope
- ☐ Walkway Surface
- ☐ Temporary Walkways

#### ☐ Walkway Location and Placement

**Problem:** Many walkways are located or placed in such a way that they abut potential hazards.

Slide 1 **Solution:** In order to be considered an accessible route, overhanging objects such as signs or tree branches must be mounted or trimmed so that there is an 80 in (2030 mm) vertical clearance above the walkway surface. Street furniture, shrubs, sign posts and parking meters must be placed so there is at least a 36 in (915 mm) wide sidewalk. Continuous driveway entrances (no curb) should be avoided. If a hazard cannot be avoided, a means (such as a curb, protective barrier, a hand rail or a detectable warning strip) must be devised to warn the disabled pedestrian of a hazardous vehicular crossing. Walkways which do not meet the requirements are not considered an accessible route. [4.4.1, 4.4.2, 4.3.3]

#### ☐ Walkway Width

Slide 2 **Problem:** Some walkways in urban areas, especially in the older cities, are quite narrow. The width is further restricted when the city engineering department places parking meters and signs along the curb.

**Solution:** Affix parking meters and signs to the exterior walls of the buildings when the sidewalk width is restricted. Eliminate street furniture and consolidate signage onto one strategically located post. In new construction, walkway width must be at least 36 in (915 mm). Recommended width to accommodate two-way traffic is 60 in (1525 mm). If possible, provide a 60 in (1525 mm) wide by 60 in (1525 mm) long passing area every 200 ft (61 m). [4.3.3, 4.3.4]

## ☐ Walkway Slope and Cross Slope

**Problem:** Some walkways are so steep that they cannot be used by persons with disabilities who are elderly. Some walkways are so flat and have no cross slope so they do not drain properly.

**Solution:** Walkways with slopes greater than 1:20 (5 percent) should be treated as a ramp. Since this is impractical in many cities, an accessible route should be located to avoid steep grades whenever possible. If the terrain is very flat, the walkways should have a slight cross slope so that water will drain from the surface. A maximum 1:50 (2 percent) cross slope is required in new construction of an Accessible Route. [4.3.7]

## ☐ Walkway Surfaces

**Problem:** Many sidewalks in urban areas are broken. After they are patched the joints are uneven and rough. Access grates or vent grates in the sidewalks have been damaged so that edges protrude above the adjacent surface or the center of the grate sags well below the adjacent surface.

**Solution:** Joints between different materials should be flush. A maximum of 1/4 in (6 mm) vertical difference is allowable on an Accessible Route. If the difference in elevation is between 1/4 to 1/2 in (6 to 13 mm) the edge should be beveled with a 1:2 slope. For existing streets and sidewalks, try to define an alternate route which avoids barriers. [4.3.8]

**Problem:** Walkways around the perimeter of urban construction sites are often rough, uneven and slippery.

**Solution:** Temporary walkways must be planned and built to comply with the ADAAG Standards, cited above. [4.1.1(4)]

**Problem:** Some walkways on the transit property are at the same level as the roadway at the passenger drop off area. It is difficult for people with vision impairments to tell when they are in the roadway.

**Solution:** If a new walk crosses or adjoins a vehicular way and the walking surfaces are not separated by curbs, railings, or other elements between the pedestrian and vehicular areas, the boundary between the areas shall be defined by a continuous detectable warning which is 36 in (915 mm) wide. The detectable warning shall comply with ADAAG 4.29.2. [4.29.5]

## **CURB RAMPS**

### **DEFINITIONS**

**Curb:** The edge of a walk or street surface which has been raised to protect or contain.

**Curb Cut:** The removal or termination of a portion of a continuous street curb to permit a ramped connection between two surfaces at different elevations.

**Curb Ramp:** A pedestrian ramp which cuts through a curb or builds up to it from a lower level.

### **APPLICABLE STANDARDS**

Curb Ramps	ADAAG 4.7
Slope	ADAAG 4.8.2
Surface	ADAAG 4.5.1, 4.5.2
Detectable Warnings	ADAAG 4.7.7, 4.29.2

## PROBLEMS AND SOLUTIONS

This section presents problems that commonly occur with curb ramps. Solutions that incorporate the applicable ADAAG standard are presented for each problem.

### Checklist of Problems

- ☐ Curb Height
- ☐ Curb Ramp Direction and Location
- ☐ Curb Height
- ☐ Curb Ramp Width
- ☐ Curb Ramp Slope and Length
- ☐ Curb Ramp Transition
- ☐ Curb Ramp Side Flare Slope
- ☐ Curb Ramp Surface Materials
- ☐ Curb Ramp Detectable Warning
- ☐ Curb Ramp Maintenance

### ☐ Curb Height

**Problem:** Very high or low curbs are difficult for some pedestrians to cross and are difficult to treat with a curb ramp.

**Solution:** Whenever possible, curbs should be 6 in (150 mm) high or less. When locating a curb ramp in an area that has curbs higher than 6 in (150 mm), the designer should ensure that the sidewalk is wide enough to accommodate the runout of the curb ramp using the desirable slope of 1:12. A slope of 1:10 or 1:8 is permitted for short ramps. If a slope of 1:8 cannot be obtained, the placement of the curb ramp should be changed. Low or "mountable" curbs are not suitable for wheelchair access without a curb ramp. [4.7.2]

## ☐ Curb Ramp Direction and Location

**Problem:** A curb ramp can be hazardous if it is located such that:

- It directs the user out of the marked crosswalk, or
- It requires the user to make abrupt turns, or
- It does not line up and point in the same direction as the crosswalk, or
- It does not provide a directional queue to the crosswalk direction, or
- It requires the user to enter the pedestrian flow at a right angle.

Slide 3 **Solution:** The curb ramp should be positioned within, line up with, and run generally in the same direction as the marked crosswalk. Diagonal curb ramps (one ramp on the corner serving both crosswalks) are permitted but should be uniform in design and placement throughout a jurisdiction. Consistency of design in placement is as important as the specific design. When determining the direction of a curb ramp, the designer should ensure that it is positioned so that there is an overrun space at each end of the curb ramp. The overrun space should be a minimum of 48 in (1220 mm). If 48 in (1220 mm) is not available at the top of the curb ramp, then the slope of the flared sides of the curb ramp must not exceed 1:10. [4.7.9, 4.7.10, 4.7.5]

**Problem:** Curb Ramps are difficult for some pedestrians to travel across because of the side slopes of the ramp flares.

**Solution:** Pedestrian traffic should not have to move across the ramp and side flares. If this is not possible, then side flares should not exceed 1:10. [4.7.5] If there is less than 48 in (1220 mm) of clear width at the top of the ramp, the flares must have a slope not to exceed 1:12.

**Problem:** Some people with visual impairments find it easier to locate the edge of the street at a curb rather than a curb ramp.

**Solution:** Whenever possible, curb ramps should be located away from the direct line of travel used by people with visual impairments. In all cases the curb ramp must be within the crosswalk lines. Curb ramps located on properties owned by a public entity that provides public transportation service must have a detectable warning surface. [4.7.7]

**Problem:** Poor drainage or a drain or grate placed in the path of a curb ramp makes the ramp difficult to use.

**Solution:** Whenever possible, avoid locating curb ramps near storm water inlets or where users must cross gratings or utility access covers. If a curb ramp must be located in line with a grating, ensure that the open spaces in the grate are no greater than 1/2 in (13 mm) in one direction and that the elongated openings are perpendicular to the predominant direction of travel. [4.5.4]

**Problem:** Curb ramps are difficult to use when placed too close to each other or too close to signs, poles, or street furniture.

**Solution:** Whenever possible, locate the curb ramp so that one curb ramp will provide access to both directions at the corner. Do not locate curb ramps too close to each other or too close to signs, light poles, or street furniture. As necessary, signs or street furniture must be relocated to properly install the curb ramp. In general, placement and design consistency is desirable. [4.7.10]

**Problem:** Curb ramps located behind tall bushes or street furniture can be hazardous because they preclude a clear line of sight between wheelchair users and oncoming traffic.

**Solution:** Curb ramps should be located so there is a clear line of sight between the user of the curb ramp and oncoming vehicles. "No Parking" signs or trimming or removing shrubbery may be warranted to maintain a clear line of sight. [4.7.8]

## ☐ Curb Ramp Width

**Problem:** If the curb ramp is too narrow and is heavily used by pedestrians, pedestrians who are disabled may be forced to wait in the street. If the curb ramp is too wide, there is little level ground left for people who do not want to use ramps.

**Solution:** Width of curb ramps shall be no less than 36 in (915 mm). In areas where snow is common a 48 in (1220 mm) width makes snow removal easier. On street intersections with high pedestrian volume, curb ramps should be wider to lessen the conflict between wheelchair users and other pedestrians. [4.7.3]

## ☐ Curb Ramp Slope and Length

**Problem:** Curb ramps that are too steep or too long cannot be traversed by some people who are disabled. If the gradient of the existing sidewalk and the camber of the road are not considered, the curb ramp may become too steep.

**Solution:** The maximum slope of a curb ramp constructed as part of a new facility must be 1:12. If a curb ramp is installed at an existing intersection and the desirable 1:12 slope cannot be achieved, then a steeper slope may be used within the following parameters.

<u>Maximum Curb Height</u>	<u>Maximum Horizontal Projection</u>	<u>Available Slope Range</u>
3 in (75 mm)	2 ft (0.6 m)	1:10 not to exceed 1:8
6 in (150 mm)	5 ft (1.5 m)	1:12 not to exceed 1:10

In accordance with the standard, in no case can a slope steeper than 1:8 be used. [4.7.2]



## ☐ Curb Ramp Transitions

**Problem:** A step as small as 1/2 in (13 mm) will prevent some people in wheelchairs from using the curb ramp. Wheelchair users often have to "take a run" at a ramp. Any step at the bottom of the ramp or an abrupt transition between the ramp and the sidewalk or street may overturn the wheelchair. Abrupt transitions between the curb ramp and the street may snag the foot rest of the wheelchair.

**Solution:** Transitions between the curb ramp and sidewalk and the curb ramp and the gutter shall be free of abrupt changes in grade. The slope of the adjacent sidewalk and gutter shall never exceed 1:20. [4.7.2]

## ☐ Curb Ramp Side Flare Slope

**Problem:** The flared sides of the curb ramp are often very steep and are hazardous for all pedestrians, especially for wheelchair users.

**Solution:** The location of the curb ramp determines the treatment of the slopes or sides. If a curb ramp is located where pedestrians would not normally walk across the ramp and the sidewalk width at the top of the curb ramp is greater than 48 in (1220 mm), a curb ramp with returned curbs may be used. [4.7.5]

**Problem:** A curb ramp with steep side flares located such that its length traverses the entire sidewalk is hazardous to all pedestrians. A vertical drop off at the edge of a curb ramp is hazardous.

**Solution:** If a curb ramp is located where pedestrians must walk across the ramp and the sidewalk width at the top of the curb ramp is less than 48 in (1220 mm), the curb ramp side flare slopes shall not exceed 1:12. If a curb ramp is located where pedestrians must walk across the ramp and the sidewalk width at the top of the curb ramp is more than 48 in (1220 mm), the curb ramp cross slopes shall not exceed 1:10. [4.7.5, Figure 12(a)]

## ☐ Curb Ramp Surface Materials

**Problem:** Curb ramp surfaces are sometimes slippery, particularly around the gutter. Curb ramp surfaces finished with rough textures to assist pedestrians with visual impairments are difficult to keep clean and can become hazardous. Pedestrians with visual impairments may not detect the location of the curb ramp if it is the same color and texture as the sidewalk or street. Painting of curb ramps with certain paints can make them slippery.

**Solution:** Curb ramp surfaces shall be stable, firm, and slip resistant. The visual contrast of the curb ramp should be different than that of the adjoining sidewalk and street. This can be achieved by using different colored materials. The surface of the ramp should not be so smooth that it is slippery when it is wet and it should not be so rough that it collects dirt or makes it uncomfortable for wheelchair users. Certain concrete stains, which leach into the surface and thus become part of it, may be applied to in-place concrete. [4.5.1]

## ☐ Curb Ramp Detectable Warning

**Problem:** Persons with vision impairments cannot tell when they have entered a street if they happen to walk in the direct path of a wide curb ramp with gently flared cross slopes.

**Solution:** Detectable warnings must be placed at the curb ramp. The detectable warning must extend the full width and depth of the curb ramp, exclusive of the flared sides. A detectable warning must consist of raised truncated domes with a diameter of nominal 0.9 in (23 mm), at the base, a height of nominal 0.2 in (5 mm) and a center to center spacing of nominal 2.35 in (60 mm). Detectable warnings must contrast visually with adjoining surfaces, either light-on-dark or dark-on-light and be an integral part of the curb ramp. [4.29]

**Note:** If a transit agency constructs the curb ramp, regardless of whether it is on its property, it must comply with ADAAG.

## ☐ Curb Ramp Maintenance

**Problem:** Snow, ice, and deicing agents can deteriorate curb ramps making them hazardous. Snow and/or debris accumulation can make curb ramps unusable.

**Solution:** A maintenance program should be initiated to insure that all curb ramps on accessible routes are cleaned periodically and snow is removed.

**Problem:** Repaving of the street can cause a step or a transition problem at the bottom of the curb ramp.

**Solution:** When streets are repaved or repaired, the contract specifications for the project should specify no lip between the new pavement and the gutter or curb ramp. If the transit agency has jurisdiction or "sign-off" or approval of work done by other entities (e.g., city) it must exercise whatever authority it has to ensure compliance with ADAAG, to the extent possible. [4.5.2]

## **CROSSWALKS**

### **DEFINITIONS**

**Crosswalk:** A part of a roadway, generally at an intersection, that is delineated for pedestrian crossing.

**Stop Line:** A wide solid line on the roadway extending across all approach roadway lanes which is used in conjunction with a stop sign, traffic signal, officer's direction or other legal requirement indicating the point behind which vehicles are required to stop.

### **APPLICABLE STANDARDS**

Manual on Uniform Traffic Control Devices,  
1988, Crosswalks and Crosswalk Lines  
Detectable Warnings

MUTCD Section 3B-18  
ADAAG 4.29.5, 4.29.2

## PROBLEMS AND SOLUTIONS

The crossing of a street in an urban area or suburban area is one of the most hazardous points enroute to a transit facility entrance. Crosswalk markings at signalized intersections and across intersection approaches on which traffic stops, serve primarily to guide pedestrians in the proper safe path. Crosswalk markings across roadways on which traffic is not controlled by traffic signals or STOP signs, must also serve to warn motorists of a pedestrian crossing point at non-intersection locations. These markings legally establish the crosswalk.

When a crosswalk directs pedestrians across the street directly into the entrance of a transportation facility owned by a public entity and the street surface is at the same level as the transportation facility entrance (e.g., no curbs between the street and entrance sidewalk area), a detectable warning must be utilized between the pedestrian area and the vehicular area.

### Checklist of Problems

- ☐ Crosswalk Location and Approach
- ☐ Crosswalk Width and Length
- ☐ Crosswalk Markings
- ☐ Crosswalk Surface

### ☐ Crosswalk Location and Approach

**Problem:** Some urban and many suburban intersections do not have marked crosswalks across the street.

**Solution:** Crosswalks should be marked at all intersections where there is substantial conflict between pedestrians and vehicles. Crosswalks should also be provided where there is a continued large concentration of pedestrians. An accessible route may cross a vehicular way only if it is marked. [MUTCD 3B-18]

**Problem:** Some crosswalks are not placed perpendicular to the curb line. This skewed placement may cause persons with visual impairments to walk outside of the marked area.

**Solution:** Whenever possible crosswalks should be perpendicular to the curb line. The curb ramp must be placed within the crosswalk lines. This will direct people with visual impairments into the marked crossing.

**Problem:** Vehicles often stop or park in the crosswalk and force the pedestrians to walk outside of the marked area into oncoming traffic.

Slide  
4

**Solution:** A stop line should accompany a crosswalk. The stop line should be placed 4 ft (1.2 m) in advance of and parallel to the nearest crosswalk line. A "No Parking" zone should be designated from 20 to 30 ft (6 to 9 m) back from the nearest crosswalk line. In some cities parking in the crosswalk area has been eliminated by extending that part of the sidewalk that adjoins the crosswalk out to the edge of the travel lane.

**Problem:** The crosswalk leading from a major parking facility owned by the city leads directly into the entrance of a rapid rail terminal. The entrance to the rail terminal is fully accessible. Because of the large pedestrian volume entering the rail terminal, the pedestrian area at the entrance is at the same level as the street (e.g., no curb defining the pedestrian area and the vehicular drop-off area). Without curbs or railings it is difficult for people with vision impairments to know when they are in the vehicular area.

**Solution:** If a walk crosses or adjoins a vehicular way, and the walking surfaces are not separated by curbs, railings or other elements between the pedestrian areas and the vehicular areas, the boundary between the areas shall be defined by a continuous detectable warning which is 36 in (915 mm) wide, and consisting of raised truncated domes with a diameter of nominal 0.9 in (23 mm), at the base, a height of nominal 0.2 in (5 mm) and a center-to-center spacing of nominal 2.35 in (60 mm) in the same horizontal or vertical row (rows are staggered) and shall contrast visually with adjoining surfaces, either light-on-dark or dark-on-light. The material used to provide contrast shall be an integral part of the walking surface. [4.29.5, 4.29.2]

**Note:** The detectable warning is on the pedestrian portion of the walk, not in the vehicular way.

## ☐ Crosswalk Width and Length

**Problem:** Crosswalks are often too narrow and become congested during heavy pedestrian movements. This can be hazardous for people with ambulatory difficulties or poor balance.

**Solution:** Crosswalk widths should never be less than 6 ft (1.8 m) wide. Where pedestrian volumes are high the crosswalk width may be increased. [MUTCD 3B-18]

**Problem:** Some urban streets are so wide that people with ambulatory difficulties cannot make it across the street before the traffic light changes.

**Solution:** The length of the crosswalk must be coordinated with the amount of traffic signal green time or pedestrian walk time. The safe green time can be determined by assuming a maximum walking speed of 3.5 ft/sec (1.07 m/sec). An additional 2 seconds must be added for reaction time. If it is not possible to allow the required green time, a refuge island should be placed in the middle of the street; this effectively reduces the length of the crosswalk.

## ☐ Crosswalk Markings

**Problem:** Crosswalk markings vary from city to city and within a city. Some are painted lines, some are delineated by brick pavers, some are delineated by concrete borders set in the roadway pavement.

Slide 5 **Solution:** A standard crosswalk design should be adopted and used throughout a city. Crosswalk lines should be solid white lines which delineate both sides of the crosswalk area. Lines must be at least 6 in (150 mm) wide and should be spaced 6 ft (1.8 m) apart. If added visibility is required the crosswalk area may be marked with diagonal lines at a 45 degree angle to the border lines. Some crosswalks are delineated with different types of surfaces. [MUTCD 3B-18]

## ☐ **Crosswalk Surface**

**Problem:** The area within the crosswalk sometimes contains utility access covers and grates or in some cases it has been painted making it slippery when wet.

**Solution:** Crosswalk surfaces should be stable, firm, slip-resistant surfaces. Whenever possible, utility access covers and grates should be located outside the boundaries of the crosswalk. If grates or utility access covers are within the crosswalk area, they should be flush with the surrounding pavement. Gratings should have spaces no greater than 1/2 in (13 mm). [4.5.4]



## **REFUGE ISLANDS**

### **DEFINITIONS**

**Pedestrian refuge island:** Specifically defined areas for pedestrians that cannot cross the entire roadway at one time.

**Traffic control island:** A defined area between traffic lanes for control of vehicle involvements or for pedestrian refuge.

### **APPLICABLE STANDARDS**

Islands

ADAAG 4.7.11

Detectable Warnings

ADAAG 4.29.5, 4.29.2

Curb Ramps

ADAAG 4.7.1, 4.7.7

## PROBLEMS AND SOLUTIONS

Pedestrian refuge islands are useful at urban street intersections where there is a considerable amount of pedestrian traffic and where heavy volumes of vehicular traffic make it difficult to cross the entire roadway. Islands must be carefully planned and designed to provide travel paths that are obvious, easy to follow and continuous. Some typical problems are presented to illustrate the application of the standards.

### Checklist of Problems

- ☐ Refuge Island Location and Placement
- ☐ Refuge Island Shape and Size
- ☐ Refuge Island Delineation

### ☐ Refuge Island Location and Placement

**Problem:** Traffic engineers are faced with the trade-off of providing full width traffic lanes or reducing the lane widths at very wide intersections and providing a refuge island.

**Solution:** At signalized urban intersections the length of the crosswalk and the walk cycle time of the traffic signal must be reviewed. If the entire roadway cannot be traversed using a walking speed of 3.5 ft/sec (1.07 m/sec) within the walk cycle of the traffic signal and the walk signal cannot be extended then a pedestrian refuge island should be considered.

**Problem:** Some refuge islands are placed in areas where they are difficult to see from the oncoming vehicles.

**Solution:** Refuge islands must always be placed so the vehicle operator will not be surprised. Large trees or shrubs or street furniture should not be placed on the refuge island since they can obstruct the view of the vehicle operator.

## ☐ **Refuge Island Shape and Size**

**Problem:** The shape of some refuge islands is such that they entice pedestrians to cross the street where crossing is prohibited.

Slide 6 **Solution:** Refuge islands should be elongated or triangular in shape. Where crossing is prohibited the island must be narrow enough to deliver the message not to cross. Where the island is to be used as a refuge area it must be wide enough to accommodate the pedestrian volume at that intersection.

**Problem:** Some refuge islands are so narrow and small that pedestrians must stand in the street as they wait to cross.

**Solution:** Refuge islands should preferably be 72 in (1828 mm) wide. In no case should the level area be less than 48 in (1220 mm) wide. The length of a refuge island should be no less than 12 ft (3.66 m) measured from end to end and including the section at pavement level at the crosswalk location. [4.7.11]

## ☐ **Refuge Island Delineation**

**Problem:** Some refuge islands are difficult to see by persons with visual impairments because they are at the same level as the street and there is no contrast or detectable warning outlining the refuge area.

**Solution:** Refuge islands should be well lighted. If a refuge island is at the same level as the street, the island can be delineated by using pavement markings, a different texture of pavement, buttons or flexible stanchions. The color of the roadway pavement and the refuge island should contrast.

**Problem:** Some islands are delineated by a curb with no curb ramps. Other islands have had curb ramps installed at a point where there is not a sufficient level width for a person in a wheelchair to wait for the traffic to clear.

**Solution:** Any raised islands in crossings shall be cut through level with the street or have curb ramps and a level area at least 48 in (1220 mm) long in the part of the island intersected by the crossing. New curb ramps shall have a detectable warning if constructed by the transit agency. [4.7.11]

## **STAIRS, RAMPS AND HANDRAILS**

### **DEFINITIONS**

**Step:** One unit that addresses a change in elevation consisting of a riser and a tread.

**Stairs:** A series of steps, with or without landings, giving access from one level to another.

**Tread:** The horizontal surface of a step.

**Riser:** The upright (vertical) face of a step.

**Nosing:** A rounded edge of a step tread that projects over the riser.

**Ramp:** Any part of an accessible route with a running slope greater than 1:20 (5 percent).

### **APPLICABLE STANDARDS**

Stairs	ADAAG 4.9
Stair Handrails	ADAAG 4.9.4, 4.26
Ramps	ADAAG 4.8
Ramp Handrails	ADAAG 4.8.5, 4.26

## PROBLEMS AND SOLUTIONS

Although an accessible route does not include stairs, steps or escalators, it is important to understand the design standards for stairs because some people with disabilities prefer to use stairs instead of ramps. Stairs are required to comply with ADAAG 4.9 only where they connect levels not connected by ramps, elevators or lifts. However, ADAAG 4.9 provides good design guidance even when not required.

Ramps are an integral part of an accessible route and must contain specific features to ensure that they can be used by people with walking disabilities.

Handrails are an important element of both stairs and ramps, thus specific applications of handrails must be understood.

The following discussion addresses the most common problems encountered with stairs, ramps and handrails. Stairs are assumed to be covered by ADAAG 4.9.

### Checklist of Problems

- ☐ Stair Treads, Risers and Nosings
- ☐ Stair Handrails
- ☐ Ramp Length, Slope and Width
- ☐ Ramp Edge Protection and Handrails
- ☐ Ramp Landings

#### ☐ Stair Treads, Risers and Nosings

**Problem:** Many people have difficulty climbing steps, especially steps with high risers and narrow treads.

**Solution:** All steps in a flight of stairs must have uniform tread depths and riser heights. The minimum tread depth is 11 in (280 mm). A safe comfortable riser height ranges from 5 in (127 mm) to 7 in (178 mm). Treads on outdoor steps should slope approximately 1/8 in (3 mm) in 12 in (304 mm). [4.9.2]

**Problem:** Stair nosings that project too much make it difficult for people with prosthetic legs to climb because their feet can get caught in the projecting nosing.

**Solution:** Nosings shall project no more than 1-1/2 in (38 mm). The underside of the nosing shall not be abrupt. The radius of curvature at the leading edge of the tread shall be no greater than 1/2 in (13 mm). Risers shall be sloped or the underside of the nosing shall have an angle not less than 60 degrees from the horizontal. [4.9.3]

## ☐ Stair Handrails

**Problem:** Some handrails are too high or too low. Others are too close to an adjacent wall. Some gripping diameters are so large that people with disabilities cannot use them.

**Solution:** Handrails are required on both sides of all new stairways covered by the DOT rule. The handrail gripping surface shall be between 34 in (865 mm) and 38 in (965 mm) above the stair nosing. The diameter of the gripping surface of the handrail shall be 1-1/4 in (32 mm) to 1-1/2 in (38 mm). Handrails that are attached to the wall shall be mounted so that there is 1-1/2 in (38 mm) clear distance between the wall and the gripping surface. [4.9.4]

☐ **Ramp Length, Slope and Width**

**Problem:** People with disabilities find it difficult to use extremely long or steep ramps. Ramps are sometimes too narrow for a person in a wheelchair to pass anyone.

**Solution:** If the slope of a ramp is 1:12 the maximum length between landings (ramp run) is 30 ft (9.14 m). A length of 40 ft (12.19 m) can be used between landings when the slope is 1:16. Gently sloping walkways of 1:20 are not considered ramps. Ramps shall be a minimum of 36 in (915 mm) wide. A width of 60 in (1525 mm) is necessary for two wheelchairs to pass each other. [4.8.2, Fig. 16]

☐ **Ramp Edge Protection and Handrails**

**Problem:** Some ramps do not have handrails or a curb along the edge. This is hazardous to people with disabilities since they could walk off the edge of the ramp.

Slide 7 **Solution:** All new ramps shall have curbs or rails along the sides. If a curb is used it shall be at least 2 in (50 mm) high and should be wide enough to accommodate a handrail installation. Handrails must be installed if any point on the ramp is higher than 6 in (150 mm) or when the horizontal length of the ramp is greater than 72 in (1830 mm). Handrails shall be on both sides of the ramp and between 34 in (865 mm) and 38 in (965 mm) above the ramp surface. The gripping surface shall be 1-1/2 in (38 mm) away from the wall and 1-1/4 in (32 mm) to 1-1/2 in (38 mm) in diameter. [4.8.7, 4.8.5]

☐ **Ramp Landings**

**Problem:** Some ramps never have a level space where people in wheelchairs or people on crutches can stop and rest.

Slide 8 **Solution:** Ramps shall have level landings at the bottom and top of each ramp run [maximum of 30 ft (9.14 m)]. Landings shall be at least as wide as the ramp and shall be at least 60 in (1525 mm) long. If a ramp changes direction at a landing, the landing must be 60 in (1525 mm) by 60 in (1525 mm). [4.8.4]

## **SIGNAGE**

### **DEFINITIONS**

**Signage:** Messages conveyed by means of graphic symbols or lettering; verbal, symbolic, tactile and pictorial information.

### **APPLICABLE STANDARDS**

Signage

ADAAG 4.30



## PROBLEMS AND SOLUTIONS

Problems are encountered with sign placement and location, the character proportion of the text used on the sign, the finish of the material used for the sign, and the contrast between the text and the background. The following problems and solutions will illustrate the proper use of the signage standards.

### Checklist of Problems

- ☐ Sign Location and Placement
- ☐ Sign Legibility

### ☐ Sign Location and Placement

**Problem:** Street signs are often located too high to read or they are located behind other street furniture or trees where they cannot be seen.

**Solution:** Signs should be located at a height that can be read by people in wheelchairs. Care must be taken when designing the size of the sign and the mounting assembly.

Signs projecting from the walls of buildings over an accessible route with the leading edge between 27 in (685 mm) and 80 in (2030 mm) above the walkway surface can project no more than 4 in (100 mm) into the walkway. If the sign is mounted with the leading edge at or below 27 in (685 mm) or 80 in (2030 mm) above the walkway it may protrude any amount. Signs mounted on posts or pylons may overhang a maximum of 12 in (305 mm) if they are mounted between 27 in (685 mm) and 80 in (2030 mm) above the walkway. [4.4.1]

**Problem:** Signs mounted flat on walls or building surfaces are too high or there are pieces of street furniture or shrubs in the way so you cannot get close enough to read the text.

Slide 9 **Solution:** If a sign is mounted flat on a building or a wall the mounting height can be 60 in (1525 mm) above the walkway to the center line of the sign. Signs that are mounted 80 in (2030 mm) or more above the walkway should have characters or letters with a minimum height of 3 in (75 mm). The area in front of the sign should be cleared so that people may position themselves within 3 in (76 mm) of the sign without encountering any obstacles. [4.30.6]

## ☐ Sign Legibility

**Problem:** The print on some signs is too small to read. Sometimes the letters are almost the same color as the sign background and in certain lights you cannot read the sign. Some signs have a plexiglass type cover on them which causes a glare and makes it difficult to read.

**Solution:** The character proportions of letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke-width-to-height ratio between 1:5 to 1:10. Characters shall be sized according to the viewing distance from which they are read. If a sign is mounted 80 in (2030 mm) above the walkway surface the minimum character height is 3 in (75 mm). The characters and background of signs shall be eggshell, matte, or another non-glare finish. Characters and symbols shall contrast with their background -- light characters on a dark background or dark characters on a light background. [4.30.2, 4.30.3, 4.30.5]

**Problem:** Some persons with vision impairments cannot read a sign even though it has the proper character proportions and contrast.

Slide 10 **Solution:** Letters and numerals on signs which designate permanent rooms and spaces shall be raised 1/32 in (0.8 mm) upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille. Raised characters shall be at least 5/8 in (16 mm) high, but no higher than 2 in (50 mm). Pictograms shall be accompanied by the equivalent verbal (written) description placed directly below the pictogram. The border dimension of the pictogram shall be 6 in (162 mm) minimum in height. [4.30.4]

## EXERCISES

1. How wide must an accessible walkway be?
  - (a) 24 in (610 mm)
  - (b) 30 in (760 mm)
  - (c) 36 in (915 mm)
  - (d) 42 in (1065 mm)
2. A walkway is considered a ramp if its slope is greater than \_\_\_\_\_.
  - (a) 1:10
  - (b) 1:12
  - (c) 1:20
  - (d) 1:30
3. How wide must a curb ramp be?
  - (a) 24 in (610 mm)
  - (b) 36 in (915 mm)
  - (c) 42 in (1065 mm)
  - (d) 48 in (1220 mm)
4. What is the maximum flare slope for a curb ramp?
  - (a) 1:8
  - (b) 1:10
  - (c) 1:12
  - (d) 1:16
5. What is the minimum width of a crosswalk?
  - (a) 4 ft (1.2 m)
  - (b) 6 ft (1.8 m)
  - (c) 8 ft (2.4 m)
  - (d) 10 ft (3.1 m)
6. What is the minimum width of the level area on a refuge island to ensure the safety of a person with a disability?
  - (a) 4 ft (1.2 m)
  - (b) 6 ft (1.8 m)
  - (c) 8 ft (2.4 m)
  - (d) 10 ft (3.1 m)

7. What is the minimum width of the tread (stepping surface) of a step?
- (a) 7 in (175 mm)
  - (b) 9 in (230 mm)
  - (c) 11 in (280 mm)
  - (d) 12 in (300 mm)
8. If a ramp changes direction, a level landing is required. What are the minimum dimensions of the landing?
- (a) 48 in (1220 mm) by 48 in (1220 mm)
  - (b) 48 in (1220 mm) by 60 in (1525 mm)
  - (c) 54 in (1370 mm) by 54 in (1370 mm)
  - (d) 60 in (1525 mm) by 60 in (1525 mm)



## **UNIT 4-1**

# **ACCESSIBLE ROUTE BETWEEN THE TRANSIT FACILITY ENTRANCE AND THE BOARDING PLATFORM - BUS STOPS**

### **SCOPE**

The Department of Transportation rules implementing the facility accessibility requirements of ADA can be found in 49 CFR Part 37, Subpart C - Transportation Facilities. Appendix A to 49 CFR Part 37, Accessibility Guidelines for Buildings and Facilities, Section 10. Transportation Facilities, addresses the specific design standards for bus stops.

Bus stop is a general term which encompasses all of the elements associated with the access to the loading area or bus stop pad, the interface area between the bus lift or ramp and the bus stop pad, the shelter, if provided, and the bus route signage.

This unit will address the barriers that may be encountered due to location and placement of the bus stop and also the barriers that may be encountered when approaching the bus stop area.

Since most bus stops are placed on existing sidewalks, the transit agency may not have direct jurisdiction. However, where bus stop pads are built by, or on behalf of, the transit agency, the transit agency must ensure compliance with the standards in Appendix A to 49 CFR Part 37. If jurisdiction is shared, the transit agency must exert whatever authority it has to ensure compliance to the extent possible. Moreover, when siting bus stops on public sidewalks, the transit agency must choose the spot which most closely complies, within other necessary constraints. Also, when erecting new signs at existing stops, the transit agency must meet certain requirements for signage.

Unless otherwise noted, the material which follows assumes the transit agency has control of the specified design or construction element.

## **DEFINITIONS**

**Commuter Bus Service:** Fixed route bus service, characterized by service predominantly in one direction during peak periods, limited stops, use of multi-ride tickets, and routes of extended length usually between the central business district and outlying suburbs.

**Demand Responsive System:** Any system of transporting individuals including the provisions of designated public transportation service by public entities and the provision of transportation service by private entities, including but not limited to specified public service which is not a fixed route system.

**Fixed route system:** A system of transporting individuals including the provisions of designated public transportation service by public entities and the provision of designated public transportation service by private entities, including but not limited to specified public transportation service on which a vehicle is operated along a prescribed route according to a fixed schedule.

**Bus Stop:** An area dedicated by signage or pavement markings or a specially designed turnout or pull through area for on- or off-loading passengers.

**Bus Stop Sign:** A sign located at a bus stop area which identifies the transit provider and may identify the bus routes and schedules served at that stop.

**Bus Passenger Shelter:** A shelter located at a bus stop which can be used by individuals waiting to board a bus.

**Bus Stop Pad:** A firm stable surface located parallel to a roadway on a slope parallel with the roadway and connected to the sidewalk or pedestrian way.

## **APPLICABLE STANDARDS**

Bus Stops and Terminals	ADAAG 10.2
Accessible Route	ADAAG 4.3
Protruding Objects	ADAAG 4.4
Signage	ADAAG 4.30.2, 4.30.3, 4.30.5
Other Service Requirements	ADAAG 37.167

## **PROBLEMS AND SOLUTIONS**

### **Slides 1 and 2**

Bus stops are a common feature at urban and suburban intersections. Stops may be located on the near (approach) side or the far (exit) side of the intersection. The location is generally determined by city traffic engineers with consideration given to service and safety to bus system patrons, efficiency of transit operations and traffic operation in general. Bus stops in a terminal area are generally laid out in a "sawtooth" configuration.

Numerous problems can arise when a bus stop is being located. The following checklist will address some of the common problems encountered.

#### **Checklist of Problems**

- ☐ Bus Stop Siting
- ☐ Bus Stop Layout and Placement
- ☐ Bus Stop Pads
- ☐ Bus Passenger Shelters
- ☐ Bus Stop Signage
- ☐ Bus Route Information
- ☐ Enforcement



## ☐ **Bus Stop Siting**

**Problem:** Many bus stops are located where there is not enough room to deploy the lift or ramp used by people in wheelchairs to board the bus.

**Solution:** There are many factors that must be considered in locating a bus stop. Traffic flow and safety are major concerns to traffic engineers and efficient safe transit operations are concerns of the transit operator. Since most bus stops are located on property that is not under the control of the operator it is important that the transit provider work closely with the local jurisdiction's department of public works to identify sites for bus stops that can accommodate the proper layout, placement, and size for the bus stops. [10.2.2]

## ☐ **Bus Stop Layout and Placement**

Slide 3 **Problem:** Bus stops located along suburban arterials are sometimes difficult to get to.

**Solution:** Bus stops shall be connected to streets, sidewalks or pedestrian paths by an accessible route complying with ADAAG 4.3 and 4.4. [10.2.1(1)]

Slide 4 **Problem:** Some bus stops are placed several feet from the roadway and it is difficult to traverse the unstable surface between the stop area and the bus.

**Solution:** Bus stops should be placed so it is possible to connect them with a continuous stable firm surface between the sidewalk or pedestrian path that provides access to the bus stop area and the boarding or alighting point of the bus vehicle.

Slide 5 **Problem:** Some bus stop areas are laid out so that the slope of the bus stop surface is level and the roadway is going up a hill. This prevents the lift from sitting flat on the ground when lowered.

**Solution:** The slope of the bus stop area or pad parallel to the roadway shall, to the extent practicable, be the same as the roadway. [10.2.1(1)]

**Problem:** Some bus stops are laid out so that they have a severe slope perpendicular either toward or away from the street which limits the operations of a bus lift.

**Solutions:** Bus stop areas or pads shall have a minimum slope of 1:50 (2 percent) perpendicular to the roadway. This slope will provide adequate drainage. [10.2.1(1)]

Slide 6 **Problem:** Utility poles, street lights and large trees near or adjacent to the bus stop pad often restrict the access to the bus.

**Solution:** Bus stops should be located a sufficient distance from utility poles, street lights and trees to allow for the minimum clear width of 60 in (1525 mm) measured parallel to the roadway and a minimum clear length of 96 in (2440 mm) measured perpendicular to the roadway. [10.2.1(1)]

Slide 7 **Problem:** Bus stops are often placed on a sidewalk where there is a lot of existing street furniture (benches, trash receptacles, newspaper dispensers) which restrict access to the bus stop and make it difficult for people in wheelchairs to align themselves to get on the lift or ramp.

**Solution:** Street furniture that obstructs the use of a bus stop should be removed or relocated to a mid-block location where there is less congestion.

Slide 8 **Problem:** Some bus stops are located directly behind a drainage inlet in the gutter. These drainage inlets generally have a removable concrete top which can be broken or displaced if it is hit by a bus tire.

**Solution:** Avoid locating a bus stop over the top of a drainage inlet. If the drainage inlet cannot be avoided put a permanent cover over the inlet with a man-hole cover to provide a way to clean out the drain.



## Bus Stop Pads

**Problem:** Some bus stop pads are at the same level as the roadway and there is no way for a person with visual impairments to determine if he/she is standing in the roadway.

**Solution:** If a bus stop is on a transit agency's property or site and the bus stop pad is at the same level as the roadway and there are no curbs, railings or other elements separating the vehicle areas from the pedestrian areas the boundary between the areas shall be defined by a continuous detectable warning which is 36 in (915 mm) wide complying with ADAAG 4.29.2. Note: If the bus stop pad is NOT designed or constructed by the transit agency, the detectable warning may not be required. [4.29.2]

**Problem:** Some bus stop pads are not long enough, so the lift or ramp extends beyond the pad.

Slide 9 **Solution:** New bus stop pads shall have a minimum clear length of 96 in (2440 mm) measured from the curb or vehicle roadway edge and a minimum clear width of 60 in (1525 mm) measured parallel to the vehicle roadway to the maximum extent feasible with existing site constraints. [10.2.1(1)]

**Problem:** How is a transit agency supposed to construct bus stop pads at all the bus stops along the city streets and suburban arterials?

**Solution:** Section 10.2.1(1) does not require that bus stop pads be built; it does specify what a bus stop pad must look like if it is constructed.

Section 37.9(c) further explains that public entities must exert control over the construction of bus stop pads if they have the ability to do so. The Access Board and DOT realize that most physical improvements related to bus stops are out of the control of the transit provider. Section 37.9(c) states that if the transit provider has control over construction it must meet the standards. [10.2.1(1), 37.9(c)]

**Problem:** Many bus stop pads, especially in suburban areas, get soft and muddy after it rains or during the winter months, which makes it difficult for people in wheelchairs to negotiate.

**Solution:** New bus stop pads shall have a firm stable surface. For water drainage a maximum slope of 1:50 (2 percent) perpendicular to the roadway is allowed. Where there are no pads, the transit agency should consider constructing them or encouraging the appropriate jurisdiction to do so. [10.2.1(1)]

## ☐ Bus Passenger Shelters

**Problem:** Some bus passenger shelters are designed and located such that a person in a wheelchair cannot use them.

Slide 10 **Solution:** Bus passenger shelters should be designed with access openings at least 32 in (1370 mm) wide. For a front approach, maneuvering clearance at the openings should be 48 in (1220 mm) long with the width the same as the opening. For a side approach, the maneuvering area should be 42 in (1065 mm) long by 54 in (1370 mm) wide. A minimum clear floor area of 30 in (760 mm) by 48 in (1220 mm), entirely within the perimeter of the shelter shall be provided. The shelter shall be connected by an accessible route to the boarding area. [4.13.6, 10.2.1(2)]

Slide 11 **Problem:** The benches in the shelter that are installed at a bus stop area that is sloping the same way as a steep parallel roadway are too high on one end for people with certain disabilities to use.

**Solution:** Fixed or built-in benches should be from 16 in (406 mm) to 20 in (508 mm) from the ground and should be a uniform height. If the height between the bench and the ground cannot be kept relatively uniform because the bench is located on the back wall of the shelter (parallel to a steep roadway) then the bench should be repositioned on a side wall of the shelter (perpendicular to the roadway). Sufficient clear area for a wheelchair [e.g., 30 in (760 mm) by 48 in (1220 mm)] must be maintained within the shelter. [10.2.1(2)]

**Problem:** Some bus passenger shelters are located so close to the street that a person in a wheelchair cannot pass between the shelter and the curb. Other shelters are located adjacent to utility poles, signs or street lights which restrict access between the shelter and the curb.

**Solution:** When locating a shelter provide a minimum of 36 in (915 mm) of width between the curb and the shelter or between any existing pole and the shelter. ADAAG Fig. 7(b) shows that, if a wheelchair user must turn around an obstruction (such as the wall of the shelter), a minimum clear distance from the curb of 48 in (1065 mm) is required. For safety reasons, even more clearance from the curb edge is desirable. [4.3.3]

## ☐ Bus Stop Signage

Slide 12 **Problem:** Many bus stop signs have route information printed on them but the sign is mounted so high or the route information is printed so small that people with impaired vision and people in wheelchairs cannot read the sign.

Slide 13 **Solution:** When provided, all new bus route identification signs shall comply with the following. The characters and background of signs shall be eggshell, matte or other non-glare finish. Characters and symbols shall contrast with their background - either light characters on a dark background or dark characters on a light background. In addition, to the maximum extent practicable, all new bus route identification signs shall comply with ADAAG 4.30.2 and 4.30.3. ADAAG 4.30.2 and 4.30.3 require that letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke-width-to-height ratio between 1:5 and 1:10.

Characters and numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case X. Lower case characters are permitted. If the sign is mounted 80 in (2030 mm) above the walkway, the minimum character height shall be 3 in (75 mm). Signs are mounted at 80 in (2030 mm) above the ground when the sign protrudes more than 12 in (305 mm) beyond the post. Route signs could be mounted on the wall of the shelter when a shelter is present. This would make the sign readable by people in wheelchairs. If mounted on the wall of the shelter the center of the sign should be 60 in (1525 mm) from the ground surface. [10.2.1(3), 4.30.2, 4.30.3, 4.30.5]

**Problem:** People who are blind cannot tell when they are at a bus stop and when they determine they are, they do not know what routes serve that stop.

Slide 14 **Solution:** Bus stop signs could be placed on a post that has a unique cross section so that blind people could feel the size/shape of the post and know they are at a bus stop.

Route information (e.g., the routes that stop at a specific bus stop) could be placed on the sign post in Braille either on a small plaque or tack welded onto the post. As the different buses stop at a multi-route stop the drivers should be sensitive to the various disabilities and call out the bus route number. The DOT rule requires that operators either provide a means by which a person with a vision impairment can identify the bus or a means by which the person can identify himself or herself as a person seeking a ride on a particular route. [37.167, p. 45755]

**Problem:** Many local jurisdictions have passed ordinances which restrict the size of signs. At a multi-route stop if all of the route information is placed on a sign face in compliance with the ADAAG standards 4.30.2 and 4.30.3 the sign will be larger than permitted by the local ordinance.

**Solution:** Signs that are sized to the maximum dimensions permitted under legitimate local, state or federal regulations or ordinances shall be considered in compliance. In other words, use the maximum legal size of a sign and adjust the size of print as close to 3 in (75 mm) as possible so that all required route information will fit on the sign. [10.2.1(3)]

## ☐ **Bus Route Information**

**Problem:** Bus route schedules, time tables and maps are sometimes posted within the shelter at a bus stop. These are printed small and it is difficult for persons with visual impairments to read them.

**Solution:** Although the standards do not require schedules, time tables or maps to comply with ADAAG 4.30.2 and 4.30.3, the transit service provider should make every effort to provide schedules and maps in large bold print and Braille whenever possible. [10.2.1(3)]

## ☐ **Enforcement**

Slide **Problem:** Buses cannot pull up to the bus stop pad to engage the lift or ramp  
15 because cars or delivery trucks are parked near or in the bus stop area.

**Solution:** Bus stops must be clearly marked. The limits of the bus stop must be large enough for the bus to pull in close and parallel to the curb. Transit service providers should work closely with local police to enforce the no parking and no standing regulations at bus stops. In general, far-side bus stops are better than near-side stops.



## EXERCISES

1. The roadway is on an uphill grade. A bus stop is planned along the roadway. How should the bus stop pad be designed?
  - (a) On the same grade as the roadway.
  - (b) As level as practicable.
  - (c) Half way between level and the grade of the roadway.
2. The slope of a bus stop pad, perpendicular to the roadway, can affect the operation of the platform lift. Therefore, the pad should \_\_\_\_\_.
  - (a) slope away from the roadway on a 1:50 slope
  - (b) be level
  - (c) slope toward the roadway on a 1:50 slope
3. What is the minimum clear length of a newly constructed bus stop pad?
  - (a) 36 in (915 mm)
  - (b) 48 in (1220 mm)
  - (c) 60 in (1525 mm)
  - (d) 96 in (2440 mm)
4. How is the clear length measured?
  - (a) Perpendicular to the roadway edge.
  - (b) Parallel to the roadway edge.
5. What is the minimum clear width of a newly constructed bus stop pad?
  - (a) 36 in (915 mm)
  - (b) 48 in (1220 mm)
  - (c) 60 in (1525 mm)
  - (d) 72 in (1830 mm)
6. The ADA Standards do not require that bus stop pads be built, but they do specify what a bus stop pad must look like if one is constructed. ADA requires bus stop pads to be \_\_\_\_\_.
  - (a) concrete
  - (b) asphalt
  - (c) brick
  - (d) stable and firm surface

7. If a bus stop sign is on a post at approximately 80 in (2030 mm) above the ground, what is the proper height of the letters on the sign?
- (a) 5/8 in (15 mm)
  - (b) 1 in (25 mm)
  - (c) 2 in (50 mm)
  - (d) 3 in (75 mm)



**UNIT 4-2**  
**ACCESSIBLE ROUTE BETWEEN THE TRANSIT FACILITY ENTRANCE AND**  
**THE BOARDING PLATFORM - BUS TERMINALS/RAIL STATIONS**

**SCOPE**

The Department of Transportation rules implementing the facility accessibility requirements of ADA can be found at two levels of detail. The first area which addresses the more general requirements is contained in 49 CFR Part 37, Subpart C - Transportation Facilities. The second, more specific design criteria is contained in the ADA Accessibility Guidelines for Buildings and Facilities (ADAAG). Section 10, Transportation Facilities, includes additional requirements specific to transportation facilities.

This unit will address the barriers that may be encountered when entering into, circulating through, and exiting a bus terminal or rail station. The unit addresses those accessible features that are required throughout the terminal/station area and on the boarding platform.

Unless otherwise noted, this section deals with design construction or alteration carried out by or on behalf of a transit agency.

## DEFINITIONS

**"New" Transportation Facility:** A facility or station on which construction began (i.e., issuance of notice to proceed to a construction contractor) after January 25, 1992, or in the case of intercity or commuter rail stations, after October 7, 1991.

**Primary function:** A major activity for which the transportation facility or station is intended. Areas that involve primary functions include, but are not limited to, ticket purchase and collection areas, passenger waiting areas, train or bus platforms, baggage checking and return areas and employment areas.

**Altered Area:** An existing facility or part of an existing facility that because of alterations affects or could affect the usability of the facility or part of the facility in providing designated public transportation services. Alterations for which a notice to proceed or work order was issued after January 25, 1992, or for commuter or intercity rail stations after October 7, 1991 are covered by ADAAG.

**Path of Travel:** A continuous unobstructed way of pedestrian passage by means of which the altered area may be approached, entered, and exited and which connects the altered area with an exterior approach (including sidewalks, parking areas and streets) an entrance to the facility, and other parts of the facility. Path of travel also includes the restrooms, telephones, and drinking fountains serving the altered area.

**Accessible Path of Travel:** A continuous unobstructed way of pedestrian passage which may include walks and sidewalks, curb ramps and other interior or exterior pedestrian ramps, clear floor paths through corridors, waiting areas, concourses, and other improved areas, parking access aisles, elevators and lifts, bridges, tunnels, or other passageways between platforms, or a combination of these and other elements.

**Key Stations in Light and Rapid Rail Systems and Commuter Rail Systems:** Stations identified by a public entity or commuter rail authority through a prescribed public participation process and through the consideration of the following criteria:

- (1) Stations where passenger boardings exceed average station passenger boardings on the rail system by at least fifteen percent, unless such a station is close to another accessible station.
- (2) Transfer stations on a rail line or between rail lines.
- (3) Major interchange points with other transportation modes, including stations with major parking facilities, bus terminals, intercity or commuter rail stations, passenger vessel terminals or airports.
- (4) End stations, unless close to another accessible station.

- (5) Stations serving major activity centers such as employment or government centers, institutions of higher education, hospitals or other major health care facilities or other facilities that are major trip generators for individuals with disabilities.

**Intercity Rail Facility:** Facilities served by intercity rail passenger cars which are rail cars intended for use by the National Railroad Passenger Corporation (Amtrak). Intercity rail stations shall be made readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, as soon as practicable but in no event later than July 26, 2010.

## **APPLICABLE STANDARDS**

Transportation Facilities	49 CFR Part 37, Subpart C
Transportation Facilities	ADAAG 10
Entrances	ADAAG 4.14
Accessible Route	ADAAG 4.3
Signage [Exception 10.3.1(4)]	ADAAG 4.30
Automated Teller Machines	ADAAG 4.34
Controls and Operating Mechanisms	ADAAG 4.27
Doors	ADAAG 4.13
Detectable Warnings	ADAAG 4.29
Telephones	ADAAG 4.31
Elevators [Exception 10.3.1(17)]	ADAAG 4.10
Sales and Service Counters, Teller Windows, Information Counters	ADAAG 7.2
Space Allowance and Reach Ranges	ADAAG 4.2
Alterations to an Area Containing a Primary Function	ADAAG 4.1.6(2)

## PROBLEMS AND SOLUTIONS

Problems and solutions will be addressed at two levels of detail: (1) General Requirements and (2) Specific Design Requirements.

### Checklist of Problems - General Requirements

- ☐ New Construction and Alterations by Public Entities
- ☐ Key Stations (Light, Rapid, & Commuter Rail)
- ☐ Intercity Rail Accessibility
- ☐ Exceptions

### ☐ New Construction and Alterations by Public Entities

Slide 1 **Problem:** A notice to proceed was issued on January 28, 1992 for the construction of a multi-million dollar multi-modal transportation center. The center has a rapid rail station, a commuter rail station, a collector bus terminal, a large multi-level parking garage, a day-care center and direct pedestrian connections to a major shopping center. The design for this transportation complex was developed over a two-year period and the design standards required compliance with UFAS and ANSI A117.1 - 1980, Standards. "Actual" construction of the complex did not start until February 24, 1992. What, if any, modifications have to be made to ensure that the transportation complex fully complies with the American with Disabilities Act.

**Solution:** The Rule requires that all new facilities constructed after January 25, 1992 be accessible to and usable by individuals with disabilities. The requirement is keyed to construction which "begins" after January 25, 1992. The regulation defines "begin" to mean when a notice to proceed order has been issued. Since notice to proceed was issued after January 25, 1992, this entire transportation complex must be constructed in compliance with the ADAAG Standards.

Since the ADAAG standards contain additional requirements than UFAS and ANSI A117.1 - 1980, a review of the design should be initiated and appropriate changes must be added by modification to the construction contract. Note: ADAAG requires areas used as work areas to be accessible so that a person with disabilities or a person in a wheelchair can approach and enter and exit the work area. This requirement applies even if the employees who work in the work area are not disabled. [37.41, p. 45627, p. 45738]



**Problem:** Some major alteration projects are being planned for several rail stations on the system. The Rule requires a public entity undertaking alterations that affect or could affect the usability of or access to an area of a facility containing a primary function to make the alterations in such a manner that . . .

What is the definition of a primary function?

**Solution:** Primary function is a major activity for which the facility is intended. Areas of transportation facilities that involve primary functions include but are not limited to:

Ticket purchases and collection areas

Passenger waiting areas

Train and bus platforms

Baggage checking and return areas

Employment areas

Note: Employment areas involving non-occupiable spaces accessed only by ladders, catwalks, crawl spaces, very narrow passageways, or freight (non-passenger) elevators which are frequented only by maintenance and repair personnel are not required to be accessible to persons with disabilities. [37.43, p. 45627, p. 45739]

**Problem:** A large rail station alteration contract was awarded on December 17, 1991. On January 30, 1992 the notice to proceed was issued to the contractor. The alteration contract contains a number of items that specifically address accessibility. When the design was done for the project, UFAS and ANSI A117.1 - 1980 Standards were used to ensure that the altered work would comply with each and every element in UFAS and ANSI A117.1 - 1980. Since all of the design work was completed, the construction work advertised and a construction contract awarded before the effective date of the rule (January 25, 1992), it is assumed that no additional work will need to be done to make the station fully accessible.

**Solution:** Even though the construction contract was awarded prior to January 25, 1992 and the design fully complied with UFAS and ANSI A117.1 standards, the Rule requires that any alteration which "begins" after January 25, 1992 (or in the case of intercity and commuter rail stations after October 7, 1991) must comply with ADAAG standards. The regulation defines "begin" to mean notice to proceed. Since notice to proceed was not given until January 30, 1992, the alteration contract must be modified to incorporate the new ADAAG standards. [37.43, p.45627, p. 45739]

**Problem:** A transit agency made several alterations to a rail station in 1990, and all of the alterations were in conformance with UFAS and ANSI A117.1 - 1980. Do the alterations have to be changed to comply with ADAAG?

**Solution:** Previous alterations made in conformance with UFAS (for federally funded projects) are deemed to be accessible but only to the extent a specific element is covered by the applicable standard. For example, an elevator provided in conformance with UFAS is acceptable even if it is not glazed.

**Problem:** Alterations are planned for the platform of a commuter rail station. The platform will be raised to provide level boarding onto the new cars, a detectable warning strip will be added to the platform edge and signs will be upgraded to comply with the ADAAG standards. Coincidentally, the ticketing area and turnstile gates will be on the same level as the new raised platform. An existing pedestrian passageway leads from the ticketing area up a slight incline to a flight of four steps. Once past the steps, the street is accessible by an elevator which serves another station. The only alterations that are planned are those associated with the platform.

**Solution:** The Rule requires a public entity or the owner of, or entity in control of, a commuter rail station undertaking alterations that affect or could affect the usability of, or access to, an area of a facility containing a primary function, to make the alterations in such a manner that, to the maximum extent feasible, the path of travel to the altered area and the bathrooms, telephones and drinking fountains serving the altered area are accessible to and usable by individuals with disabilities, including individuals who use wheelchairs. Provided that, alterations to the path of travel, drinking fountains and bathrooms are not required to be made accessible and usable if the cost and scope of doing so would be disproportionate to the planned alteration.

Because of the Rule, the public entity must consider the costs of making the following non-accessible elements accessible: (1) the gates between the platform and the ticketing area, (2) the ticketing area, and (3) the pedestrian way between the ticketing area and the elevator to the street. This would require: (1) replacing the turnstiles with an accessible gate having a minimum clear opening of 32 in (815 mm) and having a smooth continuous surface extending from 2 in (50 mm) above the floor to 27 in (685 mm) above the floor and complying with all applicable specifications in ADAAG 4.13 Doors; (2) altering the ticketing area to comply with all applicable specifications in ADAAG 7.2 Sales and Service Counters, Teller Windows, Information Counters; (3) replacing the stairs in the pedestrian passageway with a ramp complying with ADAAG 4.8 Ramps and ensuring that the pedestrian passageway complies with ADAAG 4.3 Accessible Routes, 4.4 Protruding Objects and 4.5 Ground and Floor Surfaces.

If the costs of altering the turnstiles, ticketing area and steps is less than twenty percent of the cost of the platform alterations, all of the alterations must be undertaken.

Note: If telephones, restrooms, and a drinking fountain are available for use by the general public along the path of travel between the platform and the elevator to the street in the other station, then: (1) the telephones must be made to comply with ADAAG 4.31 Telephones, (2) the restrooms must be made accessible (e.g., grab bars ADAAG 4.26, enlarged toilet stalls ADAAG 4.17, accessible faucet controls ADAAG 4.19), and (3) the drinking fountain must be made to comply with ADAAG 4.15 Drinking Fountains and Water Coolers.

**Problem:** In the previous problem, how should the improvements be prioritized if some can be done and others cannot because of the disproportion to the cost of the alteration guidelines.

**Solution:** Priority should be given to the elements that will provide the greatest access, in the following order:

- (1) An accessible entrance
- (2) An accessible route to the altered area from the entrance
- (3) At least one accessible restroom for each sex or a single unisex restroom (where there are one or more restrooms)
- (4) Accessible telephones (including text telephones)
- (5) Accessible drinking fountains [37.43, p. 45628]

**Problem:** Some station alteration work has been designed with in-house forces. The implementation (construction) of the alterations will also be accomplished with in-house maintenance personnel, that is, no construction contract will be awarded. Since a notice to proceed will not be issued, what is the triggering event that is equivalent to the notice to proceed?

**Solution:** When alteration work is scheduled to be done with in-house forces, the date the work order is signed by the approving official is the official start date for construction. (35.43, p. 45627, p. 45739)

☐ **Key Stations (Light, Rapid and Commuter Rail)**

**Problem:** Using the criteria for defining key stations, it has been determined that ten stations are key on a particular system. The policy of the Board of Directors is full compliance with ADA, but because of funding limitations and the time it takes to implement a change (e.g., select a designer, design, advertise, award, and construction) it is not likely that all of the key stations will be modified to meet the ADAAG standards by the required date of July 26, 1993.

**Solution:** A rail operator may request an extension of the July 26, 1993 completion deadline for accessibility modifications to one or more key stations. The extension for light rail and rapid rail stations can be up to July 2020, though two-thirds of the key stations must be accessible by July 2010. Commuter rail stations can be extended up to July 2010. The extension is granted by FTA on a station-by-station basis. To justify an extension, it must be shown that making a station accessible requires extraordinarily expensive alterations, such as raising the entire platform, installing an elevator, or alterations of similar cost and magnitude. An extension cannot be granted for Station A that requires some non-extraordinarily expensive changes because Station B which has extraordinarily expensive changes will require all of the available resources. In other words, non-extraordinarily expensive charges, however costly, when considered collectively for a system are not grounds for granting an extension. [37.47 & 37.51, p. 45628, p. 45739]

**Problem:** Major alterations were completed at a rapid rail transfer station in June of 1990. These alterations made the station fully accessible in compliance with UFAS. This station has recently been designated a key station. A detailed survey was conducted and the station fully complies with UFAS and ANSI A117.1, 1980. What additional work, if any, must be done at the station?

**Solution:** An earlier alteration of an entire station in accordance with UFAS or the ANSI standard does not relieve an entity from compliance with ADAAG standards for individual elements and spaces that were not covered in the UFAS or ANSI standards. For example, if a particular individual element is required by the ADAAG standards but was not required by the UFAS or ANSI standards, that element would now be required at the key station. Note: If federal financial assistance was used to alter a facility, the UFAS would have applied. If a facility was altered without federal financial assistance, the ANSI standards would have applied.



## **Intercity Rail Stations**

**Problem:** A commuter rail system is being planned. Several of the stations that are to be used by the commuter rail train are intercity rail stations used by Amtrak trains. Are requirements for stations under the control of Amtrak different than those for rapid rail or commuter rail?

**Solution:** All intercity rail stations shall be made readily accessible to and usable by individuals with disabilities including individuals who use wheelchairs, as soon as practicable, but in no event later than July 26, 2010. This requirement is separate from and in addition to the requirements discussed in the previous Problems/Solutions for Rapid, Light and Commuter Rail Stations. [37.55, p. 45629] Where intercity and commuter rail systems share the station, the parties are expected to come to an agreement on how to share responsibility. Detailed guidance is provided in Appendix D to the DOT rule [37.49, p. 45740]. Where different parties have different schedules or deadlines for modification, the "late" part of the work should not get in the way of people's use of modifications resulting from the "early" part. [37.59, p. 45741]

## Checklist of Problems - Specific Design Requirements

- ☐ Entrances
- ☐ Accessible Routes/Circulation Paths
  - ☐ Escalators
  - ☐ Elevators
  - ☐ Illumination
  - ☐ Public Address Systems
  - ☐ Clocks
  - ☐ Telephones
- ☐ Fare Collection/Ticketing Areas
- ☐ Baggage Check/Claim Areas
- ☐ Platforms
  - ☐ Station Identification Signs
  - ☐ Station, Route, Destination Signs
  - ☐ Platform Edge
  - ☐ Platform/Vehicle Gap
  - ☐ Track Crossings

☐ **Entrances (New Construction and Key Stations)**

**Problem:** There are four entrances at one of the existing stations that has been designated as a key station. Do all four have to be made accessible? What are the design requirements for an accessible entrance to a rail station?

**Solution:** ADAAG 10.3.2(1) requires at least one accessible entrance to a key station.

The circulation path, including an accessible entrance and an accessible route shall, to the maximum extent practicable coincide with those used by the majority of the general public.

Slide 2 **Problem:** A new rapid rail station is under design. Four entrances are planned for the station. Entrance A will serve a direct connection pedestrian passageway from a Regional Shopping Mall and Condominium Complex. Entrance B will connect to a commuter rail station. Entrance C will serve a multi-level commuter parking garage and a bus terminal area where the local feeder bus routes arrive and depart. Entrance D will serve several surface parking lots and a bus terminal area where the regional commuter bus routes arrive and depart. Since cost is a major factor in the feasibility of this rapid rail station, the designer has been instructed to design the minimum acceptable accessible entrances. How many of the entrances must be made accessible?

**Solution:** If the station is designed as planned all four entrances must be made accessible to comply with the following ADAAG standards. At least one entrance to each new rapid rail station shall be accessible (comply with ADAAG 4.14 Entrances). ADAAG 4.14 requires entrances to serve transportation stops, parking and public sidewalks. In addition, if different entrances to a station serve different transportation fixed routes or groups of fixed routes, at least one entrance serving each group or route shall be accessible (comply with ADAAG 4.14 Entrances). All accessible entrances shall, to the maximum extent practicable, coincide with those used by the majority of the general public. [10.3.1(2)]

Direct connections to commercial, retail or residential facilities shall have an accessible route complying with ADAAG 4.3 from the point of connection to boarding platforms and all transportation system elements used by the public. [10.3.1(3)]



Slide **Problem:** Once it has been determined what entrance should be made accessible,  
3 how will people with disabilities know which one it is?

**Solution:** Entrances which are not accessible shall have directional signage complying with 4.30.1, 2, 3 and 5, which indicates the location of the nearest accessible entrance. The characters on the directional signage shall have a width-to-height ratio between 3:5 to 1:1 and a stroke-width-to-height ration between 1:5 to 1:10 (4.30.2). Characters shall be sized according to the viewing distance from which they are read with the minimum height measured using an upper case X. Minimum character height shall be 3 in (75 mm) when the bottom of the sign is mounted 80 in (2030 mm) above the floor. [4.30.3, 4.4.2]

The characters and background of the signs shall be eggshell, matte, or other non-glare finish. Characters shall contrast with their background - either light characters on a dark background or dark characters on a light background (4.30.5). The accessible entrance shall be identified with a sign containing the international symbol of accessibility. [10.3.1(1), 4.30.7(1)] Where signs are provided at entrances to stations identifying the station or the entrance, or both, at least one sign at each entrance shall comply with 4.30.4 and 4.30.6. Such signs shall be placed in uniform locations at entrances within the transit system to the maximum extent practicable. These station entrance signs, if provided, shall have characters which are raised 1/32 in (0.8 mm) in upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille. The raised characters shall be at least 5/8 in (16 mm) high, but no higher than 2 in (50 mm). If pictograms are used they shall have a minimum border dimension height of 6 in (152 mm). Each pictogram shall be accompanied by the equivalent verbal description placed directly below the pictogram. (4.30.4) The sign identifying the station entrance shall be installed on the nearest adjacent wall if applicable mounted at 60 in (1525 mm) from the floor to the centerline of the sign. The sign shall be mounted in a location so that a person may approach within 3 in (76 mm) of the sign without encountering protruding objects or standing within the swing of a door. [4.30.6]

If the station does not have a defined entrance, but signage is provided as outlined above, then the accessible signage shall be placed in a central location.

If it is not obvious what constitutes a "uniform location at entrances" or a "central location" where there is no defined entrance, the transit agency should discuss the issue with the local community of persons with vision impairments or organizations representing them.

☐ **Accessible Routes and Circulation Paths (New Construction and Key Stations)**

**Problem:** Many times the routes that have been made accessible are circuitous and go through some isolated areas where there are very few people.

Elevators have been installed in some stations that provide service from the street directly to one end of a side platform station serving the northbound trains. If a person with disabilities is on the street level and wants to catch a southbound train he or she must use the elevator access to the northbound platform, traverse a long route to an elevator that connects the northbound platform to a platform below on another line and then get another elevator which connects the line below to the southbound platform. This rather lengthy circulation path is difficult for persons with disabilities. There are no signs or instruction to show a person in a wheelchair how to get from the street level to the southbound train platform.

**Solution:** Elements such as ramps, elevator, or other circulation devices, fare vending or other ticketing areas and fare collection areas shall be placed to minimize the distance which wheelchair users and other persons who cannot negotiate steps may have to travel compared to the general public. The circulation path, including an accessible entrance and an accessible route, shall, to the maximum extent practicable, coincide with the circulation path used by the general public. If a circuitous route must be used to gain access to a transportation facility or if the accessible route is different than the route used by the general public signage shall be provided to indicate direction to and to identify the accessible entrance and accessible route. [10.3.1(1), 10.3.2(2)]

Slide 4 **Problem:** Many existing transit stations have direct connections to commercial, retail, and residential facilities. Unfortunately, the route between the transportation facility and the commercial, retail and residential facilities is not accessible to people in wheelchairs.

**Solution:** Direct connections to commercial, retail or residential facilities at existing stations that are key stations shall, to the maximum extent feasible, have an accessible route from the point of connection to boarding platforms and all transportation system elements used by the public. The transportation agency should include language in whatever agreement it has with the commercial, retail or residential facility which requires or encourages the provision of an accessible route from the direct connection point into the connected transit facility.

Slides 5, 6 **Problem:** Direct connections from a planned transportation facility to adjacent commercial, retail and residential developments are being considered. Some of these direct connections will not be needed until the new development is fully operational. Thus, a "knock out" panel is being provided in the transportation facility. What are the responsibilities of the public entity that is designing and will operate the transportation facility?

**Solution:** The public entity must design and construct the transportation facility in such a way that all direct connections to commercial, retail or residential facilities shall have an accessible route from the point of connection to boarding platforms and all transportation system elements used by the public. Any elements provided to facilitate future direct connections (e.g., "knock out" panels) shall be on an accessible route connecting boarding platforms and all transportation system elements used by the public. The public entity should coordinate closely with adjacent developers to ensure that an accessible route is provided between the direct connection entrance and the development.

☐ Escalators (New Construction)

Slide 7 **Problem:** Escalators leading from the street level to the mezzanine and from the mezzanine to the station platform are difficult for people with visual impairments to use because it is difficult for them to see when the moving tread reaches the comb plate.

**Solution:** On new construction, when escalators are provided they shall be designed so that at the top and bottom of each escalator run at least two contiguous treads shall be level beyond the comb plate, before the risers begin to form. All treads shall be marked by a strip of clearly contrasting color, 2 in (50 mm), wide placed parallel to the nose of each step. The material shall be at least as slip resistant as the remainder of the tread. The treads shall be apparent from both ascending and descending directions.

**Problem:** The design for the alteration of a key station is underway. There are two areas where the designer has proposed to replace stairs with escalators. What design standards are required for escalators?

**Solution:** An accessible route does not include stairs, steps or escalators. Thus, ADAAG 10.3.2 Existing Facilities: Key Stations does not address standards for escalators. Since many people with disabilities do use escalators they should be designed to be as safe as possible, especially for people with low vision. Thus, it is recommended that when escalators are provided as part of an overall alteration, they should be designed with the same parameters that were outlined in the previous Problem/Solution statement.

Slide 8 **Problem:** The width of some older escalator treads make it difficult for people who use guide dogs because the step is not wide enough for the dog to stand along-side his/her master.

**Solution:** On new construction where escalators are provided, the tread width shall be 32 in (815 mm). If a station is being altered and a new escalator is being installed, the tread should be 32 in (815 mm) wide if physically possible even though there is no specific standard.

☐ **Elevators (New Construction and Key Stations)**

**Problem:** Since an accessible route does not include stairs, steps or escalators and ramps cannot address all level change problems, it is obvious that elevators or platform lifts will have to be installed in new construction and during alterations of existing stations, key stations, specifically, to make a route accessible. What design parameters must be addressed when preparing an elevator design?

Slides **Solution:** Elevators shall be designed to comply with all applicable specifications 9A,B contained in ADAAG 4.10 Elevators. In addition, when provided in transportation facilities, elevators shall be glazed or have transparent panels to allow an unobstructed view both into and out of the elevator car. [4.10, 10.3.1(7)]

**Problem:** One of the rapid rail stations on the Blue Line has been designated a key station. In June 1990, an elevator was added to this station. No federal funds were used for this elevator project. ANSI A117.1 Specifications were used for the design and the elevator complies with the ANSI standards but it does not meet the ADAAG standards. Additional alterations are planned for this key station to bring it into compliance with the ADAAG standards. Does the elevator need to be modified to bring it into compliance with the ADAAG standards?

**Solution:** No. If the elevator was designed to comply with the 1980 ANSI standards and it still complies with those standards, it is not required to modify the elevator to comply with ADAAG standards. All other modifications that are currently being undertaken must comply with the ADAAG standards. It should be noted that this "grandfathering" applies only to alterations of individual elements and spaces and only to the extent that provisions covering those elements and spaces are found in UFAS or ANSI A117.1 - 1980. [37.9, p. 45625, p. 45735] If the previous installation of an elevator was made with federal funds, compliance with UFAS, rather than ANSI 117.1 - 1980, would have been required for the grandfather provision to apply.

Slide 9C,D **Problem:** Some areas in transportation facilities are quite restricted and it is difficult to accommodate a full-sized elevator in the area that is the most appropriate location. What are the minimum dimensions of the floor area inside the elevator, and how wide must the door be?

**Solution:** The floor area of the elevator car shall provide space for wheelchair users to enter the car, maneuver within reach of the controls and exit the car. Door openings shall be a minimum 36 in (915 mm). All elevator cars shall be a minimum 51 in (1291 mm) deep from the back wall to the front wall. A minimum clear distance of 54 in (1370 mm) is required between the back wall and the face of the door when it is closed. If the door is centered on the car, the minimum car width shall be 80 in (2030 mm). When the door is off-set to one side of the car, the minimum car width shall be 68 in (1730 mm).

Note: In transportation facilities, elevator cars with a clear floor area in which a 60 in (1525 mm) diameter circle can be inscribed may be substituted for the minimum car dimensions stated above. However, in alterations, as opposed to new construction or key station requirements, ADAAG 4.1.6(3)(c) permits an inside elevator car area of 48 in by 48 in (1220 mm by 1220 mm) where existing draft configurations or technical infeasibility prevent compliance with 4.10.9.

**Problem:** The control panels inside the car of the elevator seem to vary considerably from elevator to elevator even on the same transportation system. Is there a standard for the control panel?

**Solution:** Buttons shall be raised or flush and the smallest dimension shall be at least 3/4 in (19 mm). All control buttons shall be designated by Grade 2 Braille and sans serif characters, raised 1/32 in (0.8 mm) and at least 5/8 in (16 mm) high. Main entry floor call button shall be designated by a raised star to the left of the floor number. Any other raised pictograms shall be placed immediately to the left of the button to which they apply. Floor buttons shall have visual indicators to show when a call is registered and the indicator shall be extinguished when a call is answered. All floor buttons shall be no higher than 54 in (1370 mm) above the car floor for a side approach and 48 in (1220 mm) for a front approach. All emergency controls shall be grouped at the bottom of the panel and shall have their centerline no higher than 35 in (890 mm) above finish floor. Controls shall be located on a front wall if cars have center opening doors and at the side wall or at the front wall next to the door if cars have side opening doors.

It is desirable for the configuration of buttons in elevators throughout the system to be uniform. For example, the "up" button should always be above the "down" button on a two-stop elevator.



**Problem:** The elevator is a very critical element of an accessible route, and a very expensive element to install. Since an elevator is a specialized piece of equipment it would seem that there would be only a few manufacturers, and that it would be up to the manufacturers to produce a standard elevator which would fully comply with ADA. Yet when you ride on the various elevators around the country it seems like there is a lot of variety. How can the transportation facility designer be assured that the elevator that is selected for installation complies with the new ADAAG standards?

**Solution:** The ADAAG standards for elevators (4.10 Elevators) should be cited as the minimum standards in the elevator specifications. If the transportation facility designer shows specific design details in the contract drawings, he should ensure that those design details comply with the ADAAG standards. [Sections 4.10 and 10.3.1(17)] The ADAAG standards address the following criteria for elevators, a brief summary is provided for each criteria.

**Automatic Operation:** Elevators shall be automatic, each car shall have a self-leveling feature that will bring the car floor and landing level to within  $\pm 1/2$  in (13 mm) under rated to zero loading conditions.

Slide 10 **Hall Call Buttons:** Shall be centered at 42 in (1065 mm) above the floor. Shall have visual signals to indicate when a call is registered and when it is answered. Call button shall be a minimum of  $3/4$  in (19 mm) in the smallest dimension. Up button shall be on top of the down button. Buttons shall be raised or flush. Objects mounted below the call buttons shall not project into the elevator lobby more than 4 in (100 mm).

**Hall Lanterns:** Shall provide a visible and audible signal at each hoistway entrance to indicate which car is answering the call. Audible signals shall sound once for up, twice for down or shall have verbal announcements of "up" or "down." Visible signals shall have the following features: (1) Lantern centerline 72 in (1830 mm) above the floor, (2) visual element shall be at least  $2-1/2$  in (64 mm) in the smallest dimension, and (3) signal element shall be visible from the vicinity of the hall call buttons.

Slide 11 **Raised and Braille Characters on Hoistway Entrances:** Floor numbers shall be permanently affixed to each hoistway door jamb at 60 in (1525 mm) above the floor. Characters shall be 2 in (50 mm) high, sans serif, raised  $1/32$  in (0.8 mm). The raised numbers shall be accompanied with Grade 2 Braille.

**Door Protective and Reopening Device:** Elevator doors shall open and close automatically and shall be equipped with a reopening device that will stop and reopen the doors if there is an obstruction. The reopening device shall be capable of sensing an obstruction between 5 in (125 mm) and 29 in (735 mm) from the floor without contact. Door reopening devices shall remain on for 20 seconds and then the doors may close.

**Door and Signal Timing for Hall Calls:** This is the time that elapses starting with the visible and audible up/down signal until the doors of that car start to close. The time is calculated and is a function of the distance (D) between that door and a point in the lobby 60 in (1525 mm) in front of the furthest call button that operates that door. The equation is  $\text{Time} = D / 1.5 \text{ feet/second}$  or  $\text{Time} = D / 445 \text{ mm/second}$ . The minimum acceptable notification time shall be 5 seconds.

**Door Delay for Car Calls:** The minimum time for doors to remain open in response to a call is 3 seconds.

**Floor Plan of Elevator Cars:** Elevator cars in a transportation facility with a clear floor area in which a 60 in (1525 mm) diameter circle can be inscribed comply with the ADAAG specifications by exception.

**Floor Surface:** Shall be stable, firm and slip-resistant. If carpet or carpet tile is used, it shall be securely attached, have a firm cushion, pad or backing or no cushion or pad, have level loop, textured loop, level cut pile or level cut/uncut pile texture. Maximum pile thickness shall be 1/2 in (13 mm).

**Illumination Levels:** At car controls, platform and car threshold and landing sill shall be at least 5 footcandles (53.8 lux).

Slide 12 **Car Controls:** Buttons shall be raised or flush and the smallest dimension shall be at least 3/4 in (19 mm). All control buttons shall be designated by Grade 2 Braille and sans serif characters, raised 1/32 in (0.8 mm) and at least 5/8 in (16 mm) high. Main entry floor call button shall be designated by a raised star to the left of the floor number. Any other raised pictograms shall be placed immediately to the left of the button to which they apply. Floor buttons shall have visual indicators to show when a call is registered and the indicator shall be extinguished when a call is answered. All floor buttons shall be no higher than 54 in (1370 mm) above the car floor for a side approach and 48 in (1220 mm) for a front approach. All emergency controls shall be grouped at the bottom of the panel and shall have their centerline no higher than 35 in (890 mm) above finish floor. Controls shall be located on a front wall if cars have center opening doors and at the side wall or at the front wall next to the door if cars have side opening doors.

**Car Position Indicator:** Visual car position indicators located above the door or above the car control panel shall illuminate to show which floor the car has stopped at or passed, numerals at the visual indicator shall be at least 1/2 in (13 mm) high. An audible signal shall also sound. Audible signal shall be no less than 20 decibels with a frequency no higher than 1500 Hz.

**Emergency Communications:** If provided the highest operable part shall be 48 in (1220 mm) above the floor. The communication device shall be identified by a symbol raised 1/32 in (0.8 mm) and at least 5/8 in (16 mm) high. If the device is a handset then the cord length shall be at least 29 in (735 mm). If the device is in a closed compartment the door operating mechanism shall be operable with one hand



and shall not require tight grasping, pinching or twisting of the wrist. The force to open the door shall be no greater than 5 lbf (22.2N). The emergency system shall not require voice communication.

**Problem:** Many times I have departed the train at my normal stop and proceeded to the elevator to exit the station only to find the elevator is out of service.

**Solution:** Public and private entities providing transportation services shall maintain in operative condition those features of facilities that are required to make the facilities readily accessible to and usable by individuals with disabilities. Accessibility features such as elevators shall be repaired promptly if they are damaged or out of order. When an accessibility feature is out of order, the entity shall take reasonable steps to accommodate individuals with disabilities who would otherwise use the feature. Thus, when an elevator is out of service at Station A the transit operator should make an announcement on the train as it approaches Station A. If a station close by is accessible (Station B) the operator should announce that Station A elevator is not operating but Station B entrance, only a few blocks away, does have an elevator. This announcement should be made in a timely fashion so that the affected riders can adjust their trips. If an accessible station (Station C) is not close to Station A, the transit operator could provide accessible bus or paratransit service between Station C and Station A. This temporary service should be announced throughout the transit system if possible but at a minimum, it should be announced on all trains serving Station A.

## ☐ Illumination (New Construction and Key Stations)

**Problem:** A large suburban transportation facility has parking lots and bus platforms that are connected to the rail system. The lighting at certain points between the parking area and the rail station entrance is so dim that older people with poor vision sometimes trip and fall on some of the curbs. The ceiling lights on the mezzanine area and along some of the pedestrian routes leading to the platforms are designed so that there are bright spots and dark areas all along the route. This non-uniform lighting pattern makes it difficult for persons with low vision to see variations in the floor surface.

**Solution:** Lighting along circulation routes shall be of a type and configuration to provide uniform illumination. [10.3.1(11)] Good general illumination on accessible routes and in accessible spaces is critical to the use of transportation systems by persons with disabilities, especially persons with low vision. Many forms of visual impairment cause a person's vision to respond slowly to changes in lighting level, especially in moving from bright daylight to dim transit stations. Relatively uniform lighting levels, as well as brightness are important. Fluorescent ceiling lights with proper diffuser panels provide even illumination and are longer lasting and cheaper to operate than incandescent lights. Other types of illumination, such as Halogen, "daylight" spectrum, and some systems tested by the military, are also more appropriate for persons with visual impairments. On the other hand, recessed ceiling lights mounted in cans, or downlights, are examples of inappropriate lighting. They create pools of light and shadow which are disconcerting to many persons with low vision. Conditions such as glaucoma and cataracts cause particular susceptibility to glare and reflection which is aggravated as a person moves under succeeding downlights. Such lights also reflect off the interior surfaces of eyeglasses which may be particularly disconcerting to persons with vision impairments. Downlights are not prohibited but cannot be the only source of illumination on an accessible route or space.

Slide 13 **Problem:** The signs on the fare card machines are designed so that they appear to comply with the ADAAG standards for signage. The signs are covered with a clear plastic material. In the daylight the signs are easy to read but when it is dark and the ceiling lights shine on the signs the glare from the lights makes it impossible to read the signs.

**Solution:** Illumination levels in the areas where signage is located shall be uniform and shall minimize glare on signs. [10.3.1(11)] The transit operator should change the light bulbs in the ceiling light fixtures to see if the glare can be reduced. If the sign is covered with a clear plastic cover a non-glare plastic should be considered.

**Problem:** The entrance signs at all of the transit stations appear to comply with all of the signage requirements in ADAAG. During the day they are visible and easy to read. At night the only light on the entrance signs is from nearby city street lights. Apparently the transit operator does not provide lighting at the street level of the transit station entrance. In many areas the street lights are not close enough to the station entrance and thus it is dark and the entrance sign cannot even be seen.

**Solution:** When entrance signs are provided the transit operator should provide sufficient lighting so that the entrance sign can be seen by persons with low vision. Many times the local jurisdiction will relocate or adjust the lighting levels of the street lights if the transit operator brings lighting problems to their attention. The transit agency might also consider installing internally lighted signs, which would benefit all system users.

Slide 14 **Problem:** Some stations are lighted with indirect lighting which is located between the train tracks on side platform stations and beyond the train tracks along the station wall on center platform stations. These bright lights which shine upward tend to look like the edge of the platform for people with low vision, causing them to walk off the edge of the platform and fall onto the track bed.

**Solution:** When designing lighting in a station, care should be taken to avoid using decorative lights that are brighter than wayfinding lights. Transit operators could have people with disabilities critique the station lighting after it is installed on the first station and make changes to follow-on designs that would make the stations more accessible. Note: On all new station construction and on key stations a detectable warning is required along the edge of the platform.

## ☐ Public Address System (New Construction and Key Stations)

**Problem:** Many existing rail stations have audible public address systems which provide a range of information to the patrons of the system. These audible P.A. systems cannot be understood by people who are hard of hearing or people who are deaf. Reverberation or train noise may also reduce their usefulness to persons with average hearing.

Slide 15 **Solution:** Where public address systems are provided to convey information to the public in new and key stations, a means of conveying the same or equivalent information to persons with hearing loss or who are deaf shall be provided [10.3.1(14)]. Multi-message (LED) signs or TV monitors can be placed at strategic locations along the circulation path and on the platform. The message displayed on the screen should be clear and concise. Characters on the signs/monitors should be sized according to the viewing distance from which they are to be read. Mounting height and location should be such that persons in wheelchairs and persons with vision impairments can approach the sign/monitor within a reasonable distance without encountering protruding objects. Some routine information frequently conveyed by P.A. (e.g., no smoking, operating hours, etc.) can be disseminated by adequate signage.

Some of the problems with P.A. systems in transit facilities which make announcements difficult to understand by persons with moderate hearing loss can be addressed by placing speakers at more frequent intervals and lowering the volume. This helps reduce distortion from reverberation.

## ☐ Clocks (New Construction and Key Stations When Provided)

**Problem:** Clocks in some transportation stations and terminals are difficult to find and then when there is one it is difficult to read because the numbers are too small and do not contrast with the background.

Slide 16 **Solution:** Where clocks are provided for use by the general public, the clock face shall be uncluttered so that its elements are clearly visible. Hands, numerals, and/or digits shall contrast with the background either light-on-dark or dark-on-light. Where clocks are mounted overhead to comply with the 80 in (2030 mm) headroom height, the height of the numerals and/or digits shall be a minimum of 3 in (75 mm). Clocks, if provided, shall be placed in uniform locations throughout the transportation facility and system to the maximum extent practicable.

☐ **Telephones (New Construction and Key Stations)**

Slide 17 **Problem:** The public entity that is responsible for the design of new stations and the operation of the existing stations adopted a policy to provide public pay telephones inside all new and existing stations. Do text telephones have to be provided? If so, how many at each location?

**Solution:** If an interior public pay telephone is provided in a "transit facility" at least one interior public text telephone shall be provided in the station. [10.3.1(12a), 10.3.2(2)]

Note: The Department of Transportation defines a "transit facility" for the purposes of determining the number of text telephones required by the ADA as a physical structure the primary function of which is to facilitate access to and from a transportation system which has scheduled stops at the structure. [37.3]

Slide 18 **Problem:** Public pay telephones are provided on the street level at the entrance to all of the transit facilities on a particular system. Some entrances have only one telephone, others have as many as ten telephones. What is required by the public entity that operates the stations and if this policy of having telephones at the station entrances continues in effect for new stations, what are the requirements for the new stations?

**Solution:** Where four or more public pay telephones serve a particular entrance to a rail station and at least one is in an interior location, at least one interior public text telephone shall be provided to serve that entrance. Thus, if all of the public pay telephones are mounted in an exterior location, no text telephones are required. [10.3.1(12b), 10.3.2(2)]

Slide 19 **Problem:** Public telephones were installed on the mezzanine level of a major transfer station in 1989. This station has been designated a key station. The telephones currently comply with UFAS, but none of the telephones have telecommunication devices for the deaf (TDD's). Do these telephones need to be modified?

**Solution:** Yes. The Rule specifically provides that "grandfathering" applies only to alterations of individual elements and spaces and only to the extent that provisions covering those elements or spaces are found in UFAS or ANSI A117.1 - 1980. Thus, even though the telephones were installed in 1989 and complied with UFAS there were no text telephones installed. The new ADAAG standard (4.31 Text Telephones) requires text telephones and thus the telephones must be modified to comply with the ADAAG standard. (37.9, p.45625, p. 45735)

Slide 20 **Problem:** Text telephones are required at the key stations operated throughout the service area because telephones complying with UFAS were recently installed throughout the system. What standards should be provided so that text telephones that are installed will meet ADA requirements?

**Solution:** ADAAG 4.31.9 Text Telephone applies, which is summarized as follows: (1) Text telephones used with a pay telephone shall be permanently affixed within, or adjacent to, the telephone enclosure. If an acoustic coupler is used, the telephone cord shall be sufficiently long to allow connection of the text telephone and the telephone receiver. (2) Pay telephones designed to accommodate a portable text telephone shall be equipped with a shelf and an electrical outlet within or adjacent to the telephone enclosure. The telephone handset shall be capable of being placed flush on the surface of the shelf. The shelf shall be capable of accommodating a text telephone and shall have 6 in (152 mm) minimum vertical clearance in the area where the text telephone is to be placed. (3) Equivalent facilitation may be provided. For example, the transit operator may make a portable text telephone available at the information kiosk if equivalent service is provided. That is, if entrance A would be required to have a text telephone, the portable unit must be at the kiosk for entrance A, not entrance B. Moreover, the portable unit must be available during the same times that public pay telephones are available to the general public.



## **Fare Collection/Ticketing Areas**

**Problem:** In designing the fare collection system for new light rail, rapid rail and commuter rail systems, the question has been asked -- Can a special flash pass card be sold to people with disabilities so they can go through a simple swinging gate and won't have to deal with the automatic fare machines and fare gates?

**Solution:** Automatic fare vending, collection and adjustment (e.g., add fare) systems shall comply with ADAAG 4.34.2, 4.34.3, and 4.34.4. At each accessible entrance, such devices shall be located on an accessible route.

**Problem:** ADAAG 4.34 Automatic Teller Machines is a new standard which was not included in UFAS. Does this mean that the requirements of this new standard apply to existing facilities?

**Solution:** Existing Facilities: Key Stations (ADAAG 10.3.2) requires at least one accessible route from an accessible entrance to those areas necessary for use of the transportation system. The accessible route is required to have automatic fare vending, collection and adjustment systems which comply with ADAAG 4.34.2, 4.34.3, and 4.34.4 if this system is provided to the general public.



**Problem:** Since ADAAG 4.34 is required both on new construction and at one entrance on an accessible route at key stations on existing systems, what are the specifics of the required sections?

**Solution:** Each section (e.g., 4.34.2, .3 and .4) will be addressed. It should be noted that other standards are referenced in these specific sections which make the understanding of the entire requirement more complex than it first appears. The following design parameters will be addressed: (1) Clear Floor Space, (2) Reach Range, (3) Controls and Operating Mechanisms, and (4) Operating Instructions.

Slide 21  
Handout

**Clear Floor Space:** Free-standing or built-in units not having a clear space under them shall have a clear floorspace of 30 in (760 mm) by 48 in (1220 mm) that allows a forward or a parallel approach by a person in a wheelchair. One full unobstructed side of the clear floor space for a wheelchair shall adjoin or overlap an accessible route or adjoin another wheelchair clear floor space area. If one half or more of a forward approach clear floor space area is confined on three sides, an additional 6 in (150 mm) shall be added to the 30 in (760 mm) clear floor space width. If one half or more of a parallel approach clear floor space area is confined on three sides, an additional 12 in (305 mm) shall be added to the 48 in (1220 mm) clear floor space length. [4.34.3, 4.27.2, 4.2.4]

Slide 22  
Handout

**Reach Range:** Controls, slots and dispensers required to operate the equipment shall be between 15 in (380 mm) and 48 in (1220 mm) from the floor when the equipment is positioned for a forward approach and between 9 in (230 mm) and 54 in (1370 mm) when the equipment is positioned for a parallel approach. [4.27.3, 4.2.5, 4.2.6]

**Controls and Operating Mechanisms:** Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2N). [4.34.2, 4.27.4]

**Operating Instructions:** Instructions and all information for use shall be made accessible to and independently usable by persons with vision impairments. [4.34.3] Note: Auditory output of digital displays is one way to provide some of the necessary information but is not required.

**Problem:** ADAAG 4.34 addresses the requirements of an automatic fare vending, collection and adjustment system.. What if a system sells fare media at a booth and the fare media is used to gain access to the system?

**Solution:** If self-service collection devices which accept the fare media are provided for the use of the general public, at least one accessible device for entering, and at least one for exiting, unless one device serves both functions, shall be provided at each accessible point of entry or exit.

Slide 23 **Problem:** The fare collection devices are accessible and the fare media must be purchased at booths in stations. What are the requirements that apply to the fare media sales booth?

**Solution:** Where provided, ticketing areas shall permit persons with disabilities to obtain a ticket and shall comply with ADAAG 7.2 Sales and Service Counters, Teller Windows, Information Counters. [10.3.2(2), 10.3.1(18)] ADAAG 7.2 requires the ticketing area to be on an accessible route, and also requires that a 36 in (915 mm) long section of the main counter used by the general public be at a maximum height of 36 in (915 mm) from the floor or that an auxiliary counter with a maximum height of 36 in (915 mm) in close proximity to the main counter be provided. [7.2(2)]

Slide 24 **Problem:** The fare collection devices on a specific system are accessible in that the fare media slot is reachable and easy to use. The gates open automatically when the fare media is inserted. The only problem is that the clear open width of the gate is only 18 in (455 mm). Is this acceptable?

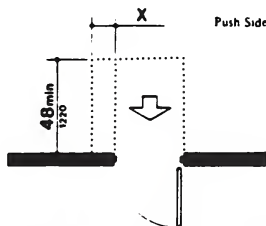
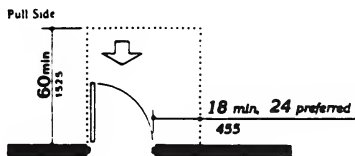
**Solution:** Accessible fare collection devices shall have a minimum clear opening of 32 in (815 mm); shall permit passage of a wheelchair; and where provided, coin or card slots and controls necessary for operation shall comply with the requirements for Reach Range and Controls and Operating Mechanisms which were presented in a previous Problem/Solution statement. [10.3.1(7), 4.27]

**Problem:** The accessible route in an existing station that has been designated as a key station does not coincide with the route taken by the general public. What measures must be taken regarding fare collections?

Slide 25 **Solution:** Where the circulation path used by persons with disabilities does not coincide with that used by the general public, accessible fare collection systems shall be located at or adjacent to the accessible point of entry or exit. [10.3.1(7)]

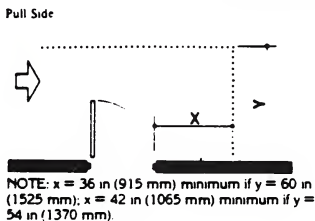
**Problem:** Since the fare gates are not wide enough for a wheelchair and the requirements call for a 32 in (815 mm) wide gate, the gate array will have to be modified which will require reducing the total number of gates available to the general public. At high volume stations, this will adversely affect the flow of patrons into and out of the station. If the fare media slot in the gate array adjacent to the emergency access gate is within reach of a person in a wheelchair, can the emergency gate be used for access to the station?

- Slide 26 **Solution:** Yes, provided the gates which must be pushed open and are used by people in wheelchairs or mobility aids have a smooth continuous surface extending from 2 in (50 mm) above the floor to 27 in (685 mm) above the floor. This surface must be flush with the gate frame, not recessed, so that parts of the gate will not catch on the wheelchair or mobility aid as it passes through. If the gate opens automatically, the smooth, continuous surface requirement does not apply. The gates shall also have a clear width of 32 in (815 mm) when the gate is open at 90 degrees. The maximum force for pushing or pulling open a gate shall be 5 lbf (22.2N). If the gate is equipped with a closer the sweep period of the closer shall be adjusted so that from an open position of 70 degrees, the gate will take at least 3 seconds to move to a point 3 in (75 mm) from the latch, measured to the leading edge of the gate. Maneuvering clearances at gates that are not automatic or power-assisted shall be as shown in the following figure. [4.13]
- Slide 27

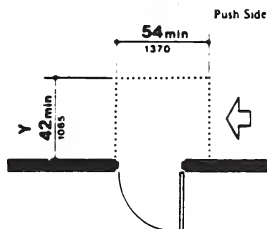


NOTE:  $x = 12$  in (305 mm) if door has both a closer and latch.

(a)  
Front Approaches — Swinging Doors

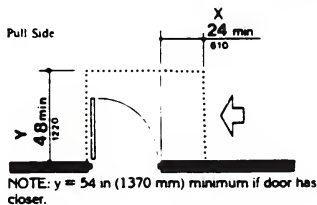


NOTE:  $x = 36$  in (915 mm) minimum if  $y = 60$  in (1525 mm);  $x = 42$  in (1065 mm) minimum if  $y = 54$  in (1370 mm).

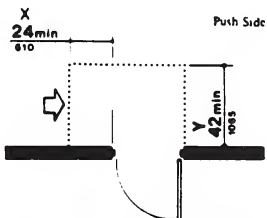


NOTE:  $y = 48$  in (1220 mm) minimum if door has both a latch and closer.

(b)  
Hinge Side Approaches — Swinging Doors



NOTE:  $y = 54$  in (1370 mm) minimum if door has closer.



NOTE:  $y = 48$  in (1220 mm) minimum if door has closer.

(c)  
Latch Side Approaches — Swinging Doors

NOTE: All doors in alcoves shall comply with the clearances for front approaches.

### Maneuvering Clearances at Doors

## ☐ **Baggage Check/Claim Areas**

**Problem:** A baggage check/claim area is to be provided when a new wing is added to a multi-modal terminal. The existing terminal has a baggage area. The terminal contains intercity, commuter rail, and rapid rail lines. What are the accessibility requirements for the new area and does the existing baggage area have to be modified?

**Solution:** If the existing terminal has been designated a key station, then the existing baggage check/claim area and the new one must comply with the following standards. The baggage area must be on an accessible route, and have space immediately adjacent which complies with all of the ADAAG Space Allowance and Reach Ranges (ADAAG 4.2). If unattended security barriers are provided, at least one gate shall be provided which must comply with ADAAG 4.13. If the gate must be pushed open by wheelchair or mobility aid users, the gate shall have a smooth continuous surface extending from 2 in (50 mm) above the floor to 27 in (685 mm) above the floor.

If the station is not a key station, only the new construction must comply.

## ☐ **Platform**

**Problem:** A new system is under design. The design standards are being reviewed to ensure they are in compliance with ADAAG. One solution proposed as a cost savings measure is to make the section of the platform closest to the accessible route comply with all of the requirements and to leave the remainder of the platform as previously designed. Is this an acceptable solution?

**Solution:** No. The standards state that stations shall not be designed or constructed so as to require persons with disabilities to board or alight from a vehicle at a location other than one used by the general public.

**Problem:** The Bus loading platform is designed so buses can use both sides of the platform. Does the platform have to be a minimum of 84 inches wide (e.g., twice the width of a bus stop pad)?

**Solution:** No. When there is space, this would be ideal, but if space is limited, operational practices may suffice (e.g., buses on either side could have staggered stops so lifts could be deployed, or if not possible, one bus waits until the other leaves). [45735]

## □ Station Identification Signs at Platforms

**Problem:** Persons with hearing loss cannot hear the train attendant announce the station stop, and at many stations, the station identification signs are not placed in a location where they can be seen when sitting on the train.

Slide  
28

**Solution:** On all new rapid rail, light rail, commuter and intercity rail, high speed rail and other fixed guideway systems and on existing platforms in key stations, station identification signs shall be placed at frequent intervals and shall be clearly visible from within the vehicle on both sides when not obstructed by another train. When station identification signs are placed close to vehicle windows on the side opposite from boarding (e.g., on the wall of a center platform station) each sign shall have the top of the highest letter or symbol below the top of the vehicle window and the bottom of the lowest letter or symbol above the horizontal mid-line of the vehicle window. Station identification signs shall be designed to comply with the following signage standards.

**Character Proportion:** Letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke-width-to-height ratio between 1:5 and 1:10.

**Character Height:** Characters and numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case X. Lower case characters are permitted. If the height above the finished floor is 80 in (2030 mm), complying with minimum headroom, the minimum character height shall be 3 in (75 mm).

**Finish and Contrast:** The characters and background of signs shall be eggshell, matte, or other non-glare finish. Characters and symbols shall contrast with their background - either light characters on a dark background or dark characters on a light background. [10.3.1(5), 10.3.2(2), 4.30.1, 4.30.2, 4.30.3, 4.30.5]

**Problem:** The station identification signs in the key stations of an existing system were designed and installed to meet the requirements of UFAS. Do any changes have to be made to the signs?

**Solution:** Some requirements for station identification signs on platforms have been added in the ADAAG standards primarily in terms of location. The existing station identification signs in the key stations must be surveyed to see if they comply with the new standards. If the existing signs do not comply with ADAAG, then new signs must be installed. [10.3.2(2), 37.47, 37.51] If the existing signs complying with UFAS are in the right locations (e.g., along platforms, at station entrances, etc.) new signs would not need to be installed. However, since all new signs and new stations must comply fully with ADAAG (e.g., character proportion, contrast, etc.), it may be desirable to change old signs to achieve design consistency.

## ☐ Destination Signs (Routes and Stations) at Platforms

**Problem:** There are route maps located at the ticket area showing where a particular train goes and listing the station stops. When waiting on the platform there are no signs to inform patrons where the train goes or at which stations the train will stop.

**Solution:** Lists of stations, routes or destinations served by the station and located on boarding areas, platforms or mezzanines, shall be designed to comply with the Character Proportion, Character Height, and Finish and Contrast specifications summarized in the Problem/Solution addressing Station Identification Signs at Platforms. [10.3.1(6), 10.3.2(2), 4.30.1, 4.30.2, 4.30.3, 4.30.5] The requirements apply to lists of stations, where they are provided, not specifically maps. However, it is desirable to have at least some maps which comply.

**Problem:** People who are blind or who have low vision cannot tell what station they are at when they are on the platform because there are no station identification signs on the platform that are accessible to them.

Slide 29 **Solution:** A minimum of one sign which identifies the specific station shall be placed on each platform or boarding area. To the maximum extent practicable, this sign shall be placed in a uniform location within the transit system. The sign shall be designed and installed to comply with the following standards.

### **Raised and Braille Characters and Pictorial Symbol Signs (Pictograms):**

Letters and numerals shall be raised 1/32 in (0.8 mm), upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille. Raised characters shall be at least 5/8 in (16 mm) high, but no higher than 2 in (50 mm). Pictograms required by this section shall be accompanied by the equivalent verbal (written) description placed directly below the pictogram. The border dimension of the pictogram shall be 6 in (152 mm) minimum in height.

**Mounting Location and Height:** To the maximum extent practicable, the sign shall be placed at a uniform location on all platforms within the system. The location for the sign shall be such that a person may approach within 3 in (76 mm) of the sign without encountering protruding objects or standing within the swing of a gate or door. Mounting height shall be 60 in (1525 mm) above the finished floor to the center line of the sign. [10.3.1(6), 10.3.2(2), 4.30.4, 4.30.6]



☐ **Platform Edge (New Construction and Key Stations)**

**Problem:** People who are blind cannot tell when they reach the end of the platform in a high platform station because there is no curb or detectable warning. As a result, there is a possibility that they can fall onto the tracks.

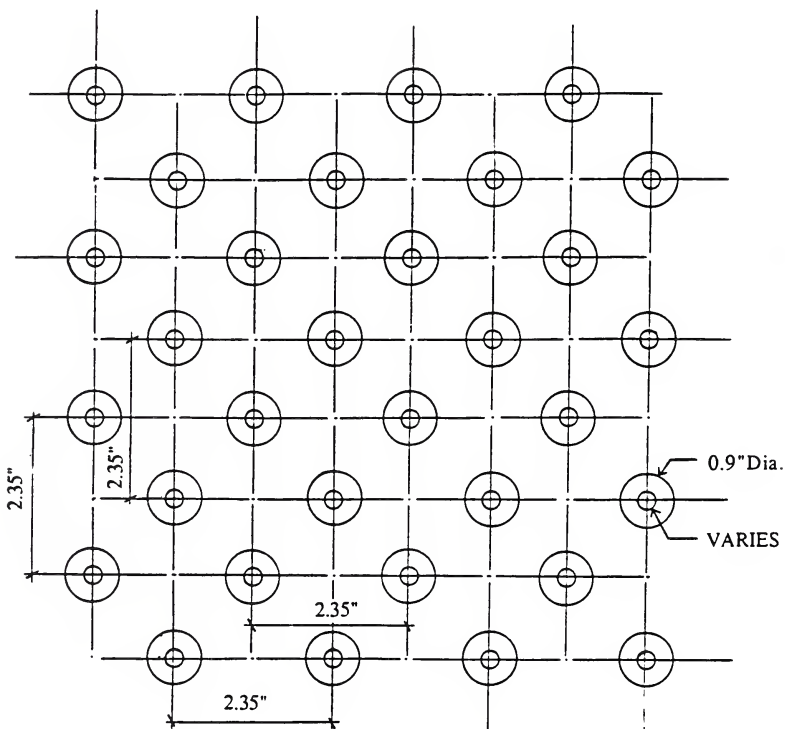
Slide 30 **Solution:** Platform edges bordering a drop-off and not protected by platform screens or guard rails shall have a detectable warning. The detectable warning shall be 24 in (610 mm) wide running the full length of the platform drop-off. Detectable warning surface shall consist of raised truncated domes with a diameter of nominal 0.9 in (23 mm), a height of nominal 0.2 in (5 mm) and a center-to-center spacing of nominal 2.35 in (60 mm). A drawing of an acceptable detectable warning is shown on the next page. The detectable warning surface shall contrast visually with adjoining surfaces, either light-on-dark or dark-on-light. The material used to provide contrast shall be an integral part of the detectable warning material [10.3.1(8), 4.29.2]

**Problem:** The detectable surfaces specifications in the ADAAG are very specific, yet the word "nominal" is used. Is there some latitude in the design of the detectable warning surface? If so, how much variation is permitted?

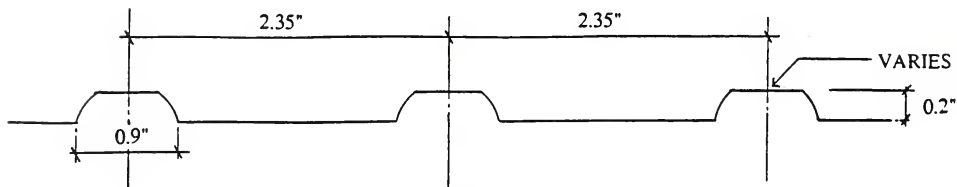
Slide 31 **Solution:** The word nominal was used to show that the 0.9 in (23 mm) diameter, 0.2 in (5 mm) height, and 2.35 in (60 mm) center-to-center spacing could be varied minimally. For example, if individual tiles or pavers are used, there may be a discrepancy in spacing between domes on adjacent tiles or pavers. This discrepancy will also depend on grouting or expansion joints between tiles, pavers or material segments. These discrepancies should be kept to a minimum.



# Detectable Warnings



**PLAN**



**SECTION**

☐ **Platform/Vehicle Horizontal Gap (New Construction and Key Stations)**

**Problem:** People who use wheelchairs and other mobility aids are afraid to use rail transportation because the horizontal gap between the vehicle and the platform is so wide that the front wheels of their mobility aids could get caught in the gap and possibly overturn. Thus, they must back onto the vehicle which is extremely difficult for people with serious disabilities because they cannot see where they are backing and other patrons will not move out of their way.

Slide 32 **Solution:** On new construction of rapid rail, light rail, commuter rail, high speed rail and intercity rail stations, the horizontal gap measured when the new vehicle is at rest shall be no greater than 3 in (76 mm). For slow moving automated guideway systems, the horizontal gap in new stations shall be no greater than 1 in (25 mm). [10.3.1(9)]

In light rail, rapid rail and commuter rail key stations, the horizontal gap measured when the vehicle is at rest, shall be no greater than 3 in (76 mm) for at least one door of each vehicle or car required to be accessible. Existing vehicles retrofitted to meet the requirements of the one-car-per-train rule [37.93] shall be coordinated with the platform such that, for at least one door, the horizontal gap is no greater than 4 in (102 mm). [10.3.2(4)]

On new construction and at existing key stations in light rail, intercity rail, and commuter rail systems where it is not operationally or structurally feasible to meet the horizontal gap requirements, mini-high platforms, car-borne or platform-mounted lifts, ramps or bridge plates or similar manually deployed devices shall suffice. [10.3.1(9), 10.3.2(4)]

☐ **Platform/Vehicle Vertical Difference**

**Problem:** The vertical difference between the floor of the rail car and the platform boarding surface is often so great that a person in a wheelchair cannot negotiate to get on or off the train.

Slide 32 **Solution:** The rail-to-platform height in new stations shall be coordinated with the floor height of new vehicles so that the vertical difference, measured when the vehicle is at rest, is within plus or minus 5/8 in (16 mm) under normal passenger load conditions. Existing vehicles operating in new stations may have a vertical difference between the new platform and the floor of the existing vehicle of plus or minus 1-1/2 in (38 mm), measured when the vehicle is at rest. [10.3.1(9)]

In light rail, rapid rail and commuter rail key stations, the platform or a portion thereof and the vehicle floor shall be coordinated so that the vertical difference, measured when the vehicle is at rest, is within plus or minus 1-1/2 in (38 mm) under normal passenger load conditions. Existing vehicles retrofitted to meet the requirements of the one-car-per-train rule shall be coordinated with the platform such that, for at least one door, the vertical difference between the vehicle floor and the platform, measured when the vehicle is at rest with 50 percent of normal passenger capacity, is within plus or minus 2 in (50 mm). [10.3.2(4)]

On new construction and at key stations in light rail, rapid rail, and commuter rail systems where it is not operationally or structurally feasible to meet the vertical difference requirements, mini-high platforms, car-borne or platform-mounted lifts, ramps or bridge plates or similar manually operated devices shall suffice. [10.3.1(9), 10.3.2(4)]

☐ **Track Crossings (New Construction and Key Stations)**

**Problem:** In some outlying stations, it is necessary to cross the tracks to get to the other platform. Many times the walkway across the track is rough and the gap between the walkway and the rail is so wide it is difficult to traverse with a wheelchair.

**Solution:** Where it is necessary to cross tracks to reach boarding platforms, the route surface shall be level and flush with the top of the rail both at the outer edges of the rail and between the rails. A maximum 2-1/2 in (64 mm) horizontal gap between the crossing surface and the inner edge of each rail is allowable. This horizontal gap permits the passage of the rail car wheel flange. If the walkway across the tracks is not separated from both platforms by curbs, railing, or other elements, the boundary between the platform and the walkway crossing the tracks shall be defined by a continuous 36 in (915 mm) wide detectable warning. The detectable warning shall consist of truncated domes with a diameter of nominal 0.9 in (23 mm), a height of nominal 0.2 in (5 mm) and a center-to-center spacing of nominal 2.35 in (60 mm). The detectable surface shall contrast visually with adjoining surfaces either light-on-dark or dark-on-light.

Slides 33,34

If a curb separates the platforms and the walkway across the tracks, a curb ramp is required which must have a detectable warning surface the full width and depth of the curb ramp that meets the above nominal specifications. The curb ramp detectable warning shall also contrast visually with the adjoining surfaces. Note: The detectable warning consisting of a surface with truncated domes does not apply to the flared sides of the curb ramp. [10.3.1(13), 4.29.5, 4.29.2]

## ☐ Maintenance of Accessible Features

**Problem:** Many of the accessible features are provided but much of the time the mechanical devices such as elevators are out of order and there are many instances where the only accessible route is blocked by temporary construction barriers or service vehicles/carts. Some of the walkways and curb ramps are deteriorated and in the winter the curb ramps are icy and snow is seldom removed from them.

Slide 35 **Solution:** To the maximum extent feasible, facilities shall be accessible to and usable by individuals with disabilities. It is not sufficient to provide accessible features such as elevators and communications systems for people with vision or hearing impairments if the features are not maintained in a manner that enables individuals with disabilities to use them. Inoperative elevators, locked accessible doors, accessible paths of travel that are blocked by equipment or boxes are not accessible to or usable by individuals with disabilities. Temporary pedestrian passageways and walkways around construction sites must comply with ADAAG.

Temporary obstructions or isolated instances of mechanical failures are not considered violations. But repairs must be made "promptly." There are no specific time limits stated in the rule for repairs to be affected. However, making repairs to accessible features must be made a high priority.

Accommodations must be made to individuals with disabilities who would otherwise use an inoperative accessibility feature. For example, if an elevator at a key station is out of service for repairs, the transit operator must announce the problem throughout the system to alert the passengers and offer an accessible alternative such as a shuttle bus to the area served by that station.

## EXERCISES

1. If there are four existing entrances to a station that has been determined to be a key station, how many of the entrances must be made accessible?
  - (a) At least one entrance
  - (b) Two entrances
  - (c) Three entrances
  - (d) All of the entrances
2. What are the requirements at the entrances that do not have to be made accessible?
  - (a) Nothing has to be done.
  - (b) A directional sign which indicates the location of the nearest accessible entrance must be added.
  - (c) Alternative accessible transportation service must be provided.
3. If an escalator is provided, even though it is not considered an accessible element, what is the desired width?
  - (a) 24 in (610 mm)
  - (b) 30 in (760 mm)
  - (c) 32 in (815 mm)
4. What is the minimum clear floor area for an elevator that has a door centered on the car?
  - (a) 51 in (1291 mm) deep by 80 in (2030 mm) wide
  - (b) 60 in (1525 mm) deep by 60 in (1525 mm) wide
  - (c) 51 in (1291 mm) deep by 68 in (1525 mm) wide
5. Announcements are made over the PA system at an existing station. This station has been designated a key station. Does the PA system need to be updated?
  - (a) No
  - (b) Yes, a new PA system is required.
  - (c) The existing PA system if operable could stay. A means of conveying the same message to persons with hearing loss or who are deaf must be provided.
6. Telephones were installed on the platform of a key rapid rail system in late 1989. They were installed in full compliance with UFAS. The new ADA specifications require that a text telephone be installed. Do the existing telephones need to be changed?

7. The existing fare gates are 27 in wide and operate automatically. Does this comply with the ADA standards?
8. When a station identification sign is placed on the wall of the station and the wall is close to the train, where should the sign be placed in relation to the windows of the train?
- (a) At the top edge of the window.
  - (b) At the bottom edge of the window.
  - (c) 24 inches above the top of the window.
  - (d) Between the top of the window and the horizontal centerline of the window.
9. How wide must the detectable platform edge be to comply with the new ADA standards?
- (a) 12 in (300 mm)
  - (b) 18 in (460 mm)
  - (c) 24 in (610 mm)
  - (d) 30 in (765 mm)
10. On a newly designed system with new rapid rail cars, what is the maximum acceptable vertical and horizontal gap between the edge of the platform and the rail car floor?
- |                             |                             |
|-----------------------------|-----------------------------|
| (a) 5/8 in (16 mm) vertical | 1 in (25 mm) horizontal     |
| (b) 5/8 in (16 mm) vertical | 2-1/2 in (64 mm) horizontal |
| (c) 5/8 in (16 mm) vertical | 3 in (76 mm) horizontal     |

UNIT 5-1  
ACCESSIBLE ROUTE BETWEEN THE BOARDING  
PLATFORM AND THE VEHICLE - BUSES/VANS

**SCOPE**

The Department of Transportation rules implementing the vehicle accessibility requirements of ADA can be found at two levels of detail. The first area which addresses the more general requirements is 49 CFR Part 37, Subpart D - Acquisition of Accessible Vehicles by Public Entities and Subpart E - Acquisition of Accessible Vehicles by Private Entities. The second more specific design criteria is contained in 49 CFR Part 38, ADA Accessibility Specifications for Transportation Vehicles, Subpart B - Buses, Vans and Systems and Subpart G - Over-the-Road Buses and Systems.

This unit will address both the general requirements and the more specific design criteria for these vehicles.

This unit will address the accessible features that are required from the time the vehicle approaches the stop until the passenger is settled on the vehicle and if appropriate, fully secured on the vehicle. Unless otherwise noted, these requirements apply to vehicles for which the solicitation closing date was on or after October 7, 1991.

This unit does not address the barriers encountered by individuals in wheelchairs or mobility aids as they board the bus and get settled into the securement devices. That portion of the trip for individuals who use wheelchairs and mobility aids is addressed in Unit 5-4.



## DEFINITIONS

Slides 1, 2, 3, 4, 5

**Bus:** Any of several types of self-propelled vehicles, generally rubber-tired, intended for use on city streets, highways, and busways, including but not limited to minibuses, forty- and thirty-foot buses, articulated buses, double-deck buses and electrically powered trolley buses used by public entities to provide designated public transportation service and by private entities to provide transportation service, including, but not limited to, specific public transportation service. Self-propelled, rubber-tired vehicles designed to look like antique or vintage trolleys are considered buses.

**New Vehicle:** A vehicle (bus) which is offered for sale or lease after manufacture without any prior use.

Slide 6

**Over-the-Road Bus:** A bus characterized by an elevated passenger deck located over a baggage compartment.

**Remanufactured Vehicle:** A vehicle (bus) which has been structurally restored and has had new or rebuilt major components installed to extend its service life.

**Wheelchair:** A mobility aid belonging to any class of three- or four-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered. A "common wheelchair" is such a device which does not exceed 30 in (760 mm) in width and 48 in (1220 mm) in length measured 2 in (50 mm) above the ground and does not weigh more than 600 pounds (270 kg) when occupied.

**Equivalent Service Standard:** The service available to individuals with disabilities, including individuals who use wheelchairs that is provided, when viewed in its entirety, in the most integrated setting appropriate to the needs of the individual and is equivalent to the service provided other individuals with respect to schedules, headways, response time, fares, service area, hours and days of service, information availability, reservation capability, constraints on capacity or service availability, and restrictions or priorities based on trip purpose. [37.105]

Slides 7, 8

**Vehicle Ramp:** A sloping surface attached to a vehicle which leads from the ground surface to the floor of a vehicle.

Slide 9

**Vehicle Lift:** An apparatus or machine attached to a vehicle which is used to transport an individual from one level to another.

## APPLICABLE STANDARDS

49 CFR 37.71	Purchase and lease of new non-rail vehicles by Public entities operating fixed route systems.
49 CFR 37.73	Purchase and lease of used non-rail vehicles by public entities operating fixed route systems.
49 CFR 37.75	Remanufacture of non-rail vehicles and purchase and lease of remanufactured non-rail vehicles by public entities operating fixed route systems.
49 CFR 37.77	Purchase or lease of new non-rail vehicles by public entities operating a demand responsive system for the general public.
49 CFR 37.101	Purchase and lease of vehicles not primarily engaged in the business of transporting people.
49 CFR 37.103	Purchase and lease of new non-rail vehicles by private entities primarily engaged in the business of transporting people.
49 CFR 37.163	Keeping Vehicle Lifts in Operative Condition: Public Entities
49 CFR 37.165	Lift and Securement Use
49 CFR 37.167	Other Service Requirements
49 CFR 37.169	Interim Requirements for Over-the-Road Buses Operated by Private Entities
49 CFR 37.173	Training Requirements
49 CFR 38.23	Mobility Aid Accessibility
49 CFR 38.25	Doors, Steps and Thresholds
49 CFR 38.27	Priority Seating Signs
49 CFR 38.29	Interior Circulation, Handrails and Stanchions
49 CFR 38.31	Lighting
49 CFR 38.33	Fare Box

49 CFR 38.35	Public Information System
49 CFR 38.37	Stop Request
49 CFR 38.39	Destination and Route Signs
38 CFR 38.153	Doors, Steps and Thresholds
38 CFR 38.155	Interior, Circulation, Handrails and Stanchions
38 CFR 38.157	Lighting

## PROBLEMS AND SOLUTIONS

Problems and solutions will be addressed at two levels of detail: (1) General Requirements and (2) Specific Design Requirements.

### Checklist of Problems - General Requirements

- ☐ Standards for Accessible Vehicles
- ☐ Operation and Maintenance
- ☐ Training

### ☐ Standards for Accessible Vehicles

**Problem:** A public entity is preparing to initiate commuter bus service and will use over-the-road buses. The public entity can either purchase the buses or contract out the service. What are the accessibility requirements for the over-the-road buses in both cases? Buses will be acquired in 1993.

**Solution:** Since commuter bus service is fixed route service, the public entity shall ensure that the over-the-road buses are readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs. [37.3, 37.71]

Slide 10 Over-the-road buses purchased by, or provided by a contractor to, a public entity must have a lift or ramp which meets the performance requirements of a regular bus lift and must meet the specific design requirements for over-the-road buses (e.g., Doors, Steps, & Thresholds; Interior Circulation, Handrails and Stanchions, and Lighting). These specific design requirements are addressed in the next part of this unit. [37.7(c)]

**Problem:** A private entity that provides inter-city service with over-the-road buses, intends to initiate commuter service to the downtown area from the outlying suburbs. What are the requirements for vehicle accessibility?

**Solution:** Boarding assistance is required for over-the-road bus service provided by private entities. Each private operator may decide what type of boarding assistance is appropriate for its operation. Even though the preamble to the DOJ Rule for Title II of ADA contains a discussion on carrying or lifting persons with disabilities, carrying the person with a disability onto the bus in this case is allowed but should be avoided. It is required by the DOT Rule that any employee who provides boarding assistance -- above all, who may carry or otherwise directly physically assist a passenger -- must be trained to provide this assistance appropriately and safely. [37.169]

## ☐ Operation and Maintenance

**Problem:** The 40-ft urban bus on a regular fixed route is equipped with a wheelchair lift but often times, at least once a month, there are several consecutive days when the lift cannot be deployed. What are the requirements on the public entity for providing back up service, or for fixing the lift?

**Solution:** When a lift breaks down while the bus is in service the driver must report the problem by the most immediate means available. If a radio is on the bus, the driver must call in the problem. If there is no radio the driver must make a phone call at the first opportunity. It is not sufficient to wait until the end of the day.

If the headways on the route exceed 30 minutes, the public entity must accommodate the passenger who requires a lift. This accommodation could be by a paratransit vehicle or another lift equipped bus.

If the lift is known to be inoperable, the public entity must take the bus out of service before the beginning of the next day and repair the lift before the vehicle is put back into service. There are exceptions to this requirement which are summarized as follows:

If there is no spare bus (with or without a lift) available to take the place of the bus with the broken lift, then the bus with the broken lift may be placed back into service the next day. If the public entity's service area has a population over 50,000, the bus with a broken lift can be kept in service a maximum of three days. If the public entity's service area has a population less than 50,000 the bus with the broken lift can be kept in service for a maximum of five days until the lift is repaired. [37.163]

**Problem:** Many of the buses throughout the service area have inoperable lifts. Is there a requirement for preventive maintenance on the lifts so the lifts can be made more reliable?

Slide 11 **Solution:** The DOT Rule requires the public entity to establish a system of regular and frequent maintenance checks of lifts sufficient to determine if they are operative. This does not mean that the public entity must check each lift operation daily. If alternate day checks or an alternate means of checking to see if the lift is operable can be implemented this is acceptable. It is a violation of the Rule if the public entity neglects to check lifts regularly and frequently. It is also a violation of the Rule if a pattern of lift breakdowns in service occurs which results in stranded passengers. [37.163]

**Problem:** The bus operator refuses to assist persons in wheelchairs. He does deploy the lift but he will not help the passenger with a disability get on the lift or help him get secured on the vehicle. The operator has stated that his union contract does not allow him to leave his seat. This type of interaction does not seem to be in the spirit of the ADA legislation.

**Solution:** Both public and private entity employers have an obligation to ensure that a passenger with a disability is able to take advantage of the accessibility and safety features on vehicles. Consequently the operator must deploy the lift properly and safely and if the passenger cannot board the bus and use the securement device on his own, the operator must assist him. Even in public and private entities whose operators do not traditionally leave their seats because of labor-management agreements or company rules, this assistance must be provided. The DOT Rule overrides any requirements to the contrary. [37.165]

**Problem:** A person with a disability, using a cane, asked the operator to deploy the lift because she could not step up onto the first step on the bus. The operator refused to deploy the lift and the person was unable to board the bus. Does the DOT Rule address this problem?

**Solution:** Yes. People using canes or walkers and other standees with disabilities who do not use wheelchairs but have difficulty using steps must be permitted to use the lift, on request. [37.165]

**Problem:** When waiting at the bus platform of a busy bus terminal it is difficult for people who have vision impairments to know which route the bus serves as it pulls up to the stop.

**Solution:** When buses from more than one route serve a given stop, public and private entities must provide a means to assist an individual with a visual impairment or other disability in determining which is the proper bus to enter. Some acceptable means are external speakers. Colored mitts or numbered cards can be held by the disabled person to show the driver which route they want. [37.167]

**Problem:** On a recent trip to town during midday, there was a person sitting in the priority seating that had a pet monkey sitting next to her. An elderly person was forced to walk further from the aisle to find a seat. Shouldn't the driver object to having people with pets on the bus and especially when they occupy the priority seat?

**Solution:** The person in the priority seat could have been disabled. One of the most common misconceptions about service animals is that a service animal is always a guide dog used by persons with visual impairments. Other animals such as monkeys have been trained and are used to assist not only blind people but persons with other disabilities as well. [37.167]

**Problem:** Recently a driver refused to deploy the lift at a stop to let a person in a wheelchair off of the bus. The driver told the person that the stop would not accommodate the lift and that he could get off at the next appropriate stop.

**Solution:** It is inconsistent with the DOT Rule for a transit provider (public or private) to refuse to let a passenger use a lift at a designated bus stop, unless the lift is physically unable to deploy or the lift would be damaged if it were deployed. If there were a temporary situation at the bus stop such as an accident, parked car blocking the accessible area of the stop or some construction that would be hazardous for any passenger to use the stop, the operator was correct in refusing to deploy the lift. [37.167]

**Problem:** A commuter bus must go through an underwater tunnel on its route to the downtown area. A person in a wheelchair that required breathing assistance from a portable medical oxygen supply tried to board the bus. The operator told the person with the disability that she could not ride the bus because the route (tunnel) taken by the bus prohibited pressurized containers.

**Solution:** The DOT Hazardous Materials Rules allow a passenger to bring a portable medical oxygen supply on board a vehicle. Since the hazardous rule permits it, the transit provider (public or private) cannot prohibit it. [ 37.167]

## ☐ Training

**Problem:** Even though all of the buses are equipped with lifts and, generally speaking, the lifts work the majority of the time, the drivers are very rude when they have to engage the lift and many of them are extremely rough when they help people in wheelchairs to board the bus.

**Solution:** Each public and private entity which operates a fixed route or demand responsive system shall ensure that personnel are trained to proficiency as appropriate to their duties. This means the drivers must be trained so that they operate vehicles and equipment safely and properly assist and treat individuals with disabilities who use the service in a respectful and courteous way with appropriate attention to the difference among individuals with disabilities. [37.173]

**Problem:** A new driver was assigned to a route where several people with disabilities normally catch the bus. When the driver stopped at the bus stop where the person in the wheelchair boards, he did not pull close enough to the curb. The person in the wheelchair told him that the lift would not reach the bus stop pad but the driver engaged the lift anyway. It took over ten minutes for the driver to load and secure the person in the wheelchair. With the normal driver it only takes about three or four minutes. This is not fair to the other passengers on the bus and most of the delay was due to the driver's poor training. Shouldn't training be required so the driver knows how to operate the lift properly?

**Solution:** Yes. The Rule requires all public and private entities operating fixed route and demand responsive service to ensure that all personnel are trained to proficiency as appropriate to their duties. [37.173]



## Checklist of Problems - Specific Design Requirements

- ☐ Bus Stops and Bus Terminal Platforms
- ☐ Vehicle Destination and Route Signs
- ☐ Doors
- ☐ Steps, Thresholds and Aisles
- ☐ Lighting
- ☐ Fare Box
- ☐ Handrails and Stanchions
- ☐ Priority Seating Signs
- ☐ Securement Area

### ☐ Bus Stops and Bus Terminal Platforms

**Problem:** The interface between the bus stop pad or platform and the lift or ramp is critical to accessing the lift or ramp.

**Solution:** The specific design requirements and location and placement requirements for bus stop pads and platforms are presented in Unit 3-1 of this document. In general, bus stop pads or platforms built by or on behalf of the transit entity shall be a level, firm, stable surface with a minimum clear length of 96 in (2440 mm) measured from the curb or vehicle roadway edge and a minimum clear width of 60 in (1525 mm) measured parallel to the vehicle roadway, to the maximum extent allowed by legal or site constraints. Such pads shall be connected to streets, sidewalks, or pedestrian paths by an accessible route. [10.2.1]

☐ **Vehicle Destination and Route Signs**

**Problem:** The signs over the front of the bus and over the side door of the bus are difficult to read because the letters are not bold enough.

Slide **Solution:** Where destination or route information is displayed on the exterior of a  
12 bus (excluding over-the-road buses) each bus shall have illuminated signs on the front and boarding side of the bus. Characters on the signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10 with a minimum character height (using an upper case X) of 1 in (25 mm) for signs on the boarding side of the bus and a minimum character height of 2 in (50 mm) for front "headsigs." Characters shall have wide spacing (generally the space between letters shall be 1/16 the height of upper case letters). Characters shall contrast with the background, either dark-on-light or light-on-dark. [38.39]

## ☐ Doors

**Problem:** When a lift is put on a transit bus shouldn't the operator of the lift take into effect the height of the bus doorway? It seems like the door height could be a problem once the lift is at the bus floor level. Do the DOT vehicle specifications require a certain doorway height? If so, what is it?

Slide 13 **Solution:** Buses longer than 22 ft (6.7 m) shall have an overhead clearance between the top of the door opening and the platform (floor) of the raised lift of 68 in (1725 mm). Note: Where the lift is the "elevator" type in which a standee is positioned fully inside the vehicle during lift operation, the door height requirement does not apply by virtue of a determination of "equivalent facilitation." If a ramp is used the clearance between the top of the door opening to the highest point on the ramp shall be 68 in (1725 mm). Note that there is no standard for the clear opening width of a transit bus because when the bus is equipped with a lift, the lift platform width dictates the door width.

Buses 22 ft (6.7 m) long and shorter shall have an overhead clearance between the top of the door opening and the platform (floor) of the raised lift of 56 in (1420 mm). If a ramp is used the clearance between the top of the door opening to the highest point on the ramp shall be no less than 56 in (1420 mm). Note that there is no standard for the clear opening width of a transit bus because when the bus is equipped with a lift, the lift platform width dictates the door width. [38.25(c)]

**Problem:** Some of the doors on over-the-road buses seem very narrow, especially when the handrails are installed. It is very difficult to negotiate the width of the doorway if baggage is being carried on by persons with walking disabilities.

**Solution:** Doors on over-the-road buses shall have a minimum clear width of 30 in (760 mm) when they are open, but in no case shall they be less than 27 in (685 mm). [38.155(c)]

☐ Steps, Thresholds and Aisles

**Problem:** When it rains and snows the steps and aisle ways in the bus get wet and some of the smooth surfaces on the floor of the bus become quite slippery.

**Solution:** All aisles, steps and floor areas where people walk and the floors in the wheelchair securement areas shall have slip-resistant surfaces on regular and over-the-road buses. [38.25(a), 38.153(a)]

**Problem:** In developing a specification for a new bus procurement, what standard should be used to ensure that the floor area and steps are provided with the mandated "slip resistant" surface?

**Solution:** The coefficient of friction can be used to measure slip resistance. The coefficient of friction is the ratio between the force necessary to move one surface over another surface and the pressure between the two surfaces. For example, the coefficient of friction for cast iron on oak is 38:100 or 0.38. A research project conducted with persons with disabilities concluded that a static coefficient of friction of 0.60 was appropriate for steps, floors and lift platforms and a coefficient of friction of 0.80 was desirable for ramps.

**Problem:** It is difficult for people with vision impairments to distinguish when they are at the edge of the step.

Slides 14, 15 **Solution:** All step edges, thresholds and the boarding edges of ramps and lift platforms shall have a band of color(s) running the full width of the step or edge. The color shall contrast from the step tread and riser, or the lift platform or ramp surface either dark-on-light or light-on-dark.

The material used should contrast by at least 70%. Percent contrast is determined by the following equation:

$$\text{Contrast} = \frac{B_1 - B_2}{B_1} \times 100$$

where  $B_1$  is the Light Reflectance Value of the lighter area and  $B_2$  is the Light Reflectance Value of the darker area. Note that in any application both white and black are never absolute: thus  $B_2$  never equals 100 and  $B_1$  is always greater than zero. [38.25(6), 38.153(b), Appendix Part 38]

## ☐ Lighting

**Problem:** When boarding and alighting the over-the-road bus that is used on the route between the outer suburbs and the city, and also when boarding and alighting the local transit bus that is used within the city, it is difficult to see in the area immediately outside of the front and rear doors when there is no street light located at the bus stop. One bus that was used had a light on the outside of the bus which helped to illuminate the boarding area and made it easier to see where the curb was located in relation to the steps.

Slide 16 **Solution:** The doorways of over-the-road buses and standard transit buses including doorways in which lifts or ramps are installed shall have outside light(s) which, when the doors are open, provide at least 1 foot-candle (11 lux) of illumination on the street or sidewalk surface, for a distance of 36 in (915 mm) measured perpendicular from all points along the outer edge of the bottom step tread.

This standard applies to both of the doors on transit buses and to the door on over-the-road buses. [38.31(c), 38.157(b)]

**Problem:** Even though the ground surface outside of the door of the bus is lighted when the doors are open, some of the treads of the steps on the transit buses and over-the-road buses appear to be quite dark.

Slides 17, 18 **Solution:** Any stepwell or doorway immediately adjacent to the driver (on transit buses and over-the-road buses) shall have, when the door is open, at least 2 foot-candles (22 lux) of illumination measured on the step tread or on the lift platform. On transit buses, at all other doorways (including doorways where lifts or ramps are installed) the stepwell or doorway shall have, at all times, at least 2 foot-candles (22 lux) of illumination measured on the step tread at the vehicle floor level. When the lift or ramp is deployed, the illumination level at the vehicular floor level shall be 2 foot-candles (22 lux). [38.31(a)(b), 38.157(a)]

## ☐ Fare Box

**Problem:** When boarding the bus, it is difficult to maneuver past the fare box, especially since the transit authority installed the new fare boxes. Apparently, there is no standard for clear width of aisle space in the vicinity of the fare box. If the fare box were moved slightly forward in conjunction with a minor modification to the pole across the aisle, there would be enough room.

Slides **Solution:** When a fare box is provided, it shall be located as far forward as  
20, 21 practicable and shall not obstruct traffic in the vestibule, especially wheelchair or  
22 mobility aids. The stanchion immediately behind the driver shall either terminate at the lower edge of the aisle-facing seat or be "dog-legged" out of the aisle maneuvering space.

The standard, as written, does not require a specific clear width for the vestibule area, but since the standard prohibits the obstruction to a wheelchair, it can be assumed that the clear width should comply with the minimum clear width for a doorway which is 32 in (815 mm). [38.33]

Although the DOT Rule does not prescribe the reach limitations for a fare box, some general guidance may be used from ADAAG 4.2 Space Allowance and Reach Ranges. If the vestibule area of the bus allows a forward approach by a person in a wheelchair, the fare box controls and money slot should be between 15 in (380 mm) and 48 in (1220 mm) from the vestibule floor. If the vestibule area of the bus allows a side or parallel approach by a person in a wheelchair, the fare box controls and money slot should be between 9 in (230 mm) and 54 in (1370 mm) from the vestibule floor.

☐ **Handrails and Stanchions**

**Problem:** When boarding the transit bus and the over-the-road bus it is difficult to reach up and grasp the rail as you negotiate the first step.

Slide 23 **Solution:** Handrails and stanchions shall be provided in the entrance to transit buses and over-the-road buses in a configuration which allows persons with disabilities to grasp such assists from outside of the vehicle while starting to board, and to continue using such assists throughout the boarding process, and throughout the fare collection process where fares are collected. [38.29(b), 38.155(a)]

**Problem:** Placement of stanchions and handrails around the vestibule area of the bus, in the doorway/stepwell area and along the aisles sometimes causes those spaces to be very difficult to negotiate in a wheelchair. Are there any specific guidelines in the DOT Rule which set the requirements for clear widths and clear floor space?

Slide 24 **Solution:** On transit buses, interior handrails and stanchions shall permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a securement location from the lift or ramp. Securement area clear floor space dimensions are specified in the DOT Rule. The DOT vehicle specifications do not specifically prescribe the minimum dimensions for the vestibule or aisles. Even though there are no specific requirements, ADAAG should be used for guidance. The following guidance is provided.

- Door clear width: ADAAG 4.13 Doors - Doorways shall have a minimum clear opening of 32 in (815 mm) with the door open 90 degrees, measured between the face of the door and the opposite stop.
- Vestibule area: ADAAG 4.2 Space Allowance and Reach Ranges - The space required for a wheelchair to make a 180 degree turn is a clear space of 60 in (1525 mm) in diameter or an L-shaped space with 36 in (915 mm) aisle ways.
- Aisle widths: ADAAG 4.2 Space Allowance and Reach Ranges - The minimum clear width for single wheelchair passage shall be 32 in (815 mm) at a point and 36 in (915 mm) continuously.
- Securement area: ADAAG 4.2 Space Allowance and Reach Ranges - The minimum clear floor area required to accommodate a single stationary wheelchair and occupant is 30 in (760 mm) by 48 in (1220 mm). [38.23(d)(2)]

**Problem:** When paying the fare, there is nothing stable to lean against or hold onto as you pay. Sometimes the driver starts moving the bus while people are still paying the fare and they must hold on to the stanchions across the aisle from the fare box. A person with a walking disability finds that difficult.

Slide 25 **Solution:** On transit buses longer than 22 ft (6.7 m) and on over-the-road buses where on-board fare collection devices are used, a horizontal passenger assist (handrail, grab bar or other appropriate surface) shall be located across the front of the vehicle between boarding passengers and the fare collection device to prevent passengers from sustaining injuries on the fare collection device or the bus windshield in the event of a sudden deceleration. This horizontal passenger assist must not restrict the vestibule space and must provide support for the boarding passenger from the doorway through the boarding process. The passenger assist shall be secured and designed such that passengers are able to lean against the assist for security while paying fares. [38.29(b), 38.155(a)]

**Problem:** Some of the handrails are so close to the surface they are attached to that it is difficult to get your fingers between the handrail and the adjacent surface. Is there a specific offset that is required when mounting handrails?

Slides 26, 27 **Solution:** Handrails used on transit buses and over-the-road buses shall have a grab bar with a cross-sectional diameter between 1-1/4 in (32 mm) and 1-1/2 in (38 mm) or shall provide an equivalent grasping surface. Edges on the handrail shall be rounded and have a minimum radius of 1/8 in (3.2 mm). All handrails shall be placed and mounted so that there is a minimum 1-1/2 in (38 mm) space between the grasping surface and the adjacent surface. [38.29(b), 38.155(a)]

**Problem:** Once the wheelchair lift has raised the wheelchair to the same level as the bus aisle floor, the individual in the wheelchair must negotiate through the fare box/driver vestibule area to the securement area. The placement of the vertical stanchions is critical because the footrest of the wheelchair can hit the stanchion as the turning movement is made if there is not enough clear floor space to maneuver the wheelchair around the corner.

**Solution:** For vehicles in excess of 22 ft (6.70 m) in length with front-door lifts or ramps, vertical stanchions immediately behind the driver shall either terminate at the lower edge of the aisle-facing seats, if applicable, or be "dog-legged" so that the floor attachment does not impede or interfere with wheelchair footrests. If the driver seat platform must be passed by a wheelchair or mobility aid user entering the vehicle, the platform, to the maximum extent practicable, shall not extend into the aisle or vestibule beyond the wheel housing. [38.29(e)]



**Problem:** When the individual in the wheelchair moves from the lift platform through the vestibule area and down the aisle and into the securement area, it is important that there are no overhead objects that could obstruct this path of travel. How much distance should there be between the floor and the overhead handrails to ensure that individuals in wheelchairs have sufficient headroom to move from the ramp platform to the securement area?

**Solution:** For vehicles in excess of 22 ft (6.70 m) in length, the minimum interior height along the path from the lift to the securement location shall be 68 in (1730 mm). For vehicles of 22 ft (6.70 m) in length or less, the minimum interior height from lift to securement location shall be 56 in (1420 mm). [38.29 (f)]

## ☐ Priority Seating Signs

**Problem:** Some transit buses do not have the sign which designates priority seating for persons with disabilities clearly displayed.

Slide 28 **Solution:** Each bus shall contain sign(s) which indicate that seats in the front of the vehicle are priority seats for persons with disabilities, and that other passengers should make such seats available to those who wish to use them. [38.27(a)]

**Problem:** Generally the seats that are signed for persons with disabilities are the seats in the front of the bus behind the driver. In most buses when you sit in these seats you are facing sideways. This is difficult when the bus starts or stops quickly and it is also difficult to see out of the window to locate where you are.

**Solution:** At least one set of seats which face forward shall be designated and signed as priority seats. [38.27(a)]

**Problem:** The city bus system has the seats on the bus laid out so they all face toward the center aisle. This makes all of the seats on the bus face sideways. Does the DOT Rule require that at least one set of forward facing seats applies in this case?

**Solution:** Even though the DOT rule does not have an exception listed for the requirement of one set of forward facing seats [38.27(a)], the technical assistance manual issued by the Access Board explains that this was not the intent.

**Problem:** The signs which designate priority seating areas and securement areas are sometimes so small you cannot read them. People with vision impairments that have to use wheelchairs have a difficult time reading the signs because the characters do not contrast with the sign background.

Slide 29 **Solution:** Characters on priority seating signs and securement location signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case X) of 5/8 in (16 mm). Wide spacing between the characters shall be used (generally the space between letters shall be 1/16 the height of the upper case letters). The characters and sign background shall contrast either light-on-dark or dark-on-light. [38.27(c)]

## ☐ Securement Area

**Problem:** Where should the securement area be located? How big must it be to accommodate one wheelchair? If there isn't enough room, can the securement area overlap some of the aisle way? How close to some of the other seats can the wheelchair get?

**Solution:** The securement area should be located as near to the accessible entrance as practicable. The area shall have a clear space of 30 in (760 mm) wide by 48 in (1220 mm) long. The securement area shall adjoin and may overlap an access path (aisle). Up to 6 in (150 mm) of the 48 in (1220 mm) clear length can extend underneath a seat or modesty panel provided there is a minimum of 9 in (230 mm) from the floor to the lowest part of the seat or panel. This 6 in (150 mm) space can be used to accommodate the footrest of the wheelchair. [38.23(d)(2)]

**Problem:** When a securement area is provided, it takes seats away from other passengers when it is not being used.

**Solution:** The securement areas may have fold-down seats to accommodate other passengers when a wheelchair or mobility aid is not occupying the space. The fold-down seats, if provided, must not obstruct the clear floor area 48 in (1220 mm) by 30 in (760 mm) when they are folded up. [38.23(d)(2)]

**Problem:** How many spaces for a wheelchair are required on a bus? Does the size of the bus have anything to do with the number of required spaces? If more spaces can be accommodated by squeezing the wheelchairs in sideways, is it better to have more spaces even though the person with the disability has to sit sideways when riding on a bus?

**Solution:** In vehicles that are longer than 22 ft (6.7 m) at least two securement areas and devices are required. At least one securement area shall be provided so that the wheelchair or mobility aid, when secured, is facing toward the front of the vehicle. If other securement areas are provided, they shall be designed so that the wheelchair or mobility aid faces either toward the front of the bus or rearward. In vehicles 22 ft (6.7 m) long or less, the securement area can be designed so that the wheelchair or mobility aid can face either toward the front or the back of the bus/van. Sidefacing securement of wheelchairs or mobility aids is prohibited. [37.239(d)(4)]

**Problem:** When secured on a bus in a rear facing position, there is concern about the possibility of whiplash if the bus has to stop quickly. Is there some requirement for a head rest to provide a safety cushion for the individual's head?

**Solution:** If the wheelchair or mobility aid faces toward the rear of the bus/van, a padded barrier shall be provided. The padded barrier shall be located such that it is centered in back of the secured wheelchair. The padded barrier shall extend from a height of 38 in (965 mm) to a height of 54 in (1370 mm) from the floor of the vehicle and shall be 18 in (455 mm) wide. [37.23(d)(4)]

**Problem:** On many of the transit buses the securement area is taken up by fold-down seats. Even though the fold-down seats are generally different in appearance than the regular seats, it is sometimes difficult to know where the securement area is especially when all of the seats are taken.

**Solution:** Each securement area or location shall have a sign designating it as such. [38.27(b)]

## EXERCISES

1. What is the minimum acceptable height of a character on the route destination sign on the side of the bus?
  - (a) 5/8 in (16 mm)
  - (b) 1 in (25 mm)
  - (c) 1-1/2 in (38 mm)
  - (d) 2 in (50 mm)
2. What is the minimum acceptable height of a character on the route destination sign on the front of the bus?
  - (a) 5/8 in (16 mm)
  - (b) 1 in (25 mm)
  - (c) 1-1/2 in (38 mm)
  - (d) 2 in (50 mm)
3. What is the acceptable lift or ramp overhead clearance of the doorway of a bus that is longer than 22 feet?
  - (a) 60 in (1525 mm)
  - (b) 68 in (1725 mm)
  - (c) 72 in (1830 mm)
  - (d) 80 in (2030 mm)
4. What is the acceptable clear width of the door for a transit bus that is longer than 22 feet?
  - (a) 27 in (685 mm)
  - (b) 30 in (760 mm)
  - (c) 32 in (810 mm)
  - (d) There is no ADA standard for door clear widths.
5. What is the maximum diameter of a handrail that will permit a disabled person to firmly grasp the rail?
  - (a) 1 in (25 mm)
  - (b) 1-1/4 in (32 mm)
  - (c) 1-1/2 in (38 mm)
  - (d) 2 in (50 mm)

6. What is the minimum interior height along the path of travel from the platform lift to a securement area on a bus that is longer than 22 feet?
- (a) 60 in (1525 mm)
  - (b) 68 in (1725 mm)
  - (c) 72 in (1830 mm)
  - (d) 80 in (2030 mm)
7. What is the acceptable height of a character on a priority seating sign?
- (a) 5/8 in (16 mm)
  - (b) 1 in (25 mm)
  - (c) 1-1/2 in (38 mm)
  - (d) 2 in (50 mm)
8. How much clear area should there be in the securement area of a transit bus?
- (a) 30 in (760 mm) by 48 in (1220 mm)
  - (b) 32 in (815 mm) by 54 in (1370 mm)
  - (c) 36 in (915 mm) by 60 in (1525 mm)
  - (d) a 60 in (1525 mm) diameter circle



**UNIT 5-2**  
**ACCESSIBLE ROUTE BETWEEN THE BOARDING PLATFORM AND THE**  
**VEHICLE - RAIL VEHICLE FROM A LEVEL BOARDING PLATFORM**

**SCOPE**

The Department of Transportation rules implementing the vehicle accessibility requirements of ADA can be found at two levels of detail. The first area which addresses the more general requirements is 49 CFR Part 37, Subpart D - Acquisition of Accessible Vehicles by Public Entities and Subpart E - Acquisition of Accessible Vehicles by Private Entities. The second more specific design criteria is contained in 49 CFR Part 38, ADA Accessibility Specifications for Transportation Vehicles, Subpart C - Rapid Rail Vehicles and Systems, Subpart D - Light Rail Vehicles and Systems, Subpart E - Commuter Rail Cars and Systems, and Subpart F - Intercity Rail Cars and Systems.

All new, used and remanufactured rapid rail and light rail vehicles, commuter rail and intercity rail cars that were purchased or leased after August 25, 1990 by a public entity, commuter rail authority or Amtrak must be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs. Those for which a solicitation closed on or after October 7, 1991, must comply with the Part 38 standards discussed in this unit.

This unit addresses the elements that must be accessible to permit persons with disabilities to determine the route of a specific train, to safely locate the accessible vehicle or car, to determine which door is accessible and board the vehicle or car that is serving the desired route from a level boarding platform before the doors close.



## **DEFINITIONS**

### **Slide 1**

**Commuter Rail Car:** A rail passenger car obtained by a commuter authority for use in commuter rail transportation.

### **Slide 2**

**Intercity Rail Passenger Car:** A rail car, intended for use by revenue passengers, obtained by the National Railroad Passenger Corporation (Amtrak) for use in intercity rail transportation.

### **Slide 3**

**Light Rail:** A streetcar-type vehicle operated on city streets, semi-exclusive rights of way, or exclusive rights of way. Service may be provided by step-entry vehicles or by level boarding.

### **Slide 4**

**Rapid Rail:** A subway-type transit vehicle railway operated on exclusive private rights of way with high level platform stations. Rapid rail also may operate on elevated or at grade level track separated from other traffic.

**New Vehicle:** A vehicle which is offered for sale or lease after manufacture without any prior use.

**Used Vehicle:** A vehicle with prior use.

### **Slide 5**

**Remanufactured Vehicle:** A vehicle which has been structurally restored and has had new or rebuilt major components installed to extend its service life.

**Retrofitted Vehicle:** A vehicle that has been modified to the extent necessary to comply with the specific accessibility standards required by the One Car Per Train Rule.

**Automated Guideway Transit System (AGT):** A fixed guideway transit system which operates with automated (driverless) individual vehicles or multi-car trains. Service may be on a fixed schedule or in response to a passenger-activated call button.

**High Speed Rail:** A rail service having the characteristics of intercity rail service which operates primarily on a dedicated guideway or track not used, for the most part, by freight, including, but not limited to, trains on welded rail, magnetically levitated (maglev) vehicles on a special guideway, or other advanced technology vehicles, designed to travel at speeds in excess of those possible on other types of railroads.

## APPLICABLE STANDARDS

49 CFR 37.79	Purchase or lease of new rail vehicles by public entities operating rapid or light rail systems.
49 CFR 37.81	Purchase or lease of used rail vehicles by public entities operating rapid or light rail systems.
49 CFR 37.83	Remanufacture of rail vehicles and purchase or lease of remanufactured rail vehicles by public entities operating rapid or light rail systems.
49 CFR 37.85	Purchase or lease of new intercity and commuter rail cars.
49 CFR 37.87	Purchase or lease of used intercity and commuter rail cars.
49 CFR 37.89	Remanufacture of intercity and commuter rail cars and purchase and lease of remanufactured intercity and commuter rail cars.
49 CFR 37.93	One car per train rule.
49 CFR 37.101	Purchase or lease of vehicles by private entities not primarily engaged in the business of transporting people.
49 CFR 37.107	Acquisition of passenger rail cars by private entities primarily engaged in the business of transporting people.
49 CFR 38 Subpart C	Rapid Rail Vehicles and Systems
49 CFR 38 Subpart D	Light Rail Vehicles and Systems
49 CFR Subpart E	Commuter Rail Cars and Systems
49 CFR Subpart F	Intercity Rail Cars and Systems

## **PROBLEMS AND SOLUTIONS**

Accessibility from the level (high or mini-high) boarding platform to rapid rail and light rail vehicles and commuter rail and intercity rail cars will be addressed at two levels of detail:

(1) General requirements and (2) Specific design requirements.

### **Checklist of Problems - General Requirements**

- ☐ Accessibility of New and Used Rapid Rail and Light Rail Vehicles
- ☐ Accessibility of Remanufactured Rapid Rail and Light Rail Vehicles
- ☐ Accessibility of New and Used Commuter Rail and Intercity Rail Cars
- ☐ Accessibility of Remanufactured Commuter Rail and Intercity Rail Cars
- ☐ One Car Per Train Rule

☐ **Accessibility of New and Used Rapid Rail and Light Rail Vehicles**

**Problem:** A city has a system which uses light rail and rapid rail vehicles. The existing vehicles are not fully accessible. A procurement is underway to order used light rail vehicles and new rapid rail vehicles. Do these vehicles have to be accessible?

**Solution:** Each public entity operating a rapid or light rail system making a solicitation after October 7, 1991 to purchase or lease a used or new rapid or light rail vehicle for use on the system shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, and complies with the standards in 49 CFR Part 38.

A public entity may purchase or lease a used rapid or light rail vehicle that is not readily accessible after making demonstrated good faith efforts to obtain an accessible vehicle. [37.79, 37.81]

**Problem:** What are the good faith efforts that must be made when trying to purchase a readily accessible used light or rapid rail vehicle? How does the public entity document the good faith efforts?

**Solution:** Good faith efforts shall include at least the following steps:

- (1) The initial solicitation for the used vehicles published by the public entity must specify that all used vehicles were to be accessible to and usable by individuals with disabilities, or, if a solicitation is not used, a documented communication so stating;
- (2) A nationwide search for accessible vehicles, involving specific inquiries to manufacturers and other transit providers; and
- (3) Advertising in trade publications and contacting trade associations. [37.81(c)]

Each public entity purchasing or leasing used rapid or light rail vehicles that are not readily accessible to and usable by individuals with disabilities shall retain documentation of the specific good faith efforts it made for three years from the date the vehicles were purchased. These records shall be made available, on request, to the FTA Administrator and the public. [37.81(d)]

☐ **Accessibility of Remanufactured Rapid and Light Rail Vehicles**

**Problem:** A transit authority plans to remanufacture some of its rapid rail vehicles and purchase some remanufactured light rail vehicles. Do the rapid rail and light rail vehicles have to meet the vehicle accessibility specifications?

**Solution:** Yes, if a light or rapid rail vehicle is remanufactured after August 25, 1990, so as to extend its useful life for five years or more, it shall, to the maximum extent feasible be readily accessible to and usable to individuals with disabilities, including individuals who use wheelchairs. [37.83]

It shall be considered feasible to remanufacture a rapid or light rail vehicle so as to be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless an engineering analysis demonstrates that doing so would have a significant adverse effect on the structural integrity of the vehicle. [37.83(c)]

**Problem:** One of the light rail lines and one of the rapid rail lines on a particular system is included on the National Register of Historic Places. The vehicles operated on the lines are considered historic. The vehicles are scheduled to be remanufactured so that the service life can be extended for another seven years. Do these "historic vehicles" have to be made accessible?

**Solution:** If a public entity operates a rapid or light rail system any segment of which is included on the National Register of Historic Places and if making a rapid or light rail vehicle of historic character used solely on such segment readily accessible to and usable by individuals with disabilities would significantly alter the historic character of such vehicles, the public entity need only make (or purchase or lease a remanufactured vehicle with) those modifications that do not alter the historic character of such vehicles. [37.83(d)]

A public entity operating a fixed route system as described above may apply in writing to the FTA Administrator for a determination of the historic character of the vehicle. The FTA Administrator shall refer such requests to the National Register of Historic Places and shall rely on its advice in making a determination of the historic character of the vehicle. [37.83(e)]

**Note:** The regulation specifically states that the exception applies to rail vehicles operated solely on a rail segment which is on the National Register. A historic vehicle operated on other lines, for promotional purposes, for example, is not covered by the exception.

☐ **Accessibility of Remanufactured Rapid and Light Rail Vehicles**

**Problem:** A transit authority plans to remanufacture some of its rapid rail vehicles and purchase some remanufactured light rail vehicles. Do the rapid rail and light rail vehicles have to meet the vehicle accessibility specifications?

**Solution:** Yes, if a light or rapid rail vehicle is remanufactured after August 25, 1990, so as to extend its useful life for five years or more, it shall, to the maximum extent feasible be readily accessible to and usable to individuals with disabilities, including individuals who use wheelchairs. [37.83]

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**Note:** The regulation specifically states that the exception applies to rail vehicles operated solely on a rail segment which is on the National Register. A historic vehicle operated on other lines, for promotional purposes, for example, is not covered by the exception.

☐ **Accessibility of New and Used Commuter and Intercity Rail Cars**

**Problem:** Do new commuter and intercity rail cars have to be accessible?

**Solution:** Amtrak or a commuter authority making a solicitation after October 6, 1991, to purchase or lease a new intercity or commuter rail car for use on the system shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs and complies with 49 CFR Part 38. [37.85, 37.87]

**Problem:** If a public entity purchases used intercity or commuter rail cars, do they have to be accessible?

**Solution:** Amtrak or a commuter authority purchasing or leasing a used intercity or commuter rail car shall ensure that the car is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

Amtrak or a commuter authority may purchase or lease a used intercity or commuter rail car that is not readily accessible to and usable by individuals with disabilities if, after making demonstrated good faith efforts to obtain an accessible vehicle, it is unable to do so. [37.85, 37.87]

**Problem:** What constitutes "demonstrated good faith efforts" to obtain an accessible vehicle?

**Solution:** Good faith efforts shall include at least the following steps:

- (1) An initial solicitation for the used vehicles published by the commuter authority or Amtrak must specify that all used vehicles were to be accessible to and usable by individuals with disabilities;
- (2) A nationwide search for accessible vehicles, involving specific inquiries to used vehicle dealers and other transit providers; and
- (3) Advertising in trade publications and contacting trade associations.

Amtrak and commuter authorities purchasing or leasing used intercity or commuter rail cars that are not readily accessible to and usable by individuals with disabilities shall retain documentation of the specific good faith efforts it made for three years from the date the vehicles were purchased or leased. These records shall be made available, on request, to the Federal Railroad Administration or FTA Administrator, as applicable. These records shall be made available to the public, on request. [37.87]

☐ **Accessibility of Remanufactured Commuter and Intercity Rail Cars**

**Problem:** If a commuter rail car or an intercity rail car is scheduled to be remanufactured, does the scope of the remanufacturing project have to address all of the accessibility specifications?

**Solution:** If Amtrak or a commuter rail authority remanufactures or purchases or leases a remanufactured car which has its life extended by ten years or more, the commuter rail and intercity rail cars shall, to the maximum extent feasible, be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

It shall be considered feasible to remanufacture an intercity or commuter rail car so as to be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless an engineering analysis demonstrates that remanufacturing the car to be accessible would have a significant adverse effect on the structural integrity of the car. [37.89]

☐ **One Car Per Train Rule**

**Problem:** What is the One Car Per Train Rule and what are the dates for implementation?

**Solution:** Each public entity providing rapid or light rail service shall ensure that each train, consisting of two or more vehicles, includes at least one car that is readily accessible as soon as practicable but in no case later than July 25, 1995. Each entity providing intercity rail service and each commuter rail authority shall ensure that each train has one car that is readily accessible as soon as practicable but in no case later than July 26, 1995. [37.93]

**Note:** For Amtrak, there is also a specific seating requirement which will not be addressed here.



Problems and solutions related to the specific design criteria address those barriers that a person with a disability encounters between the time the train arrives at a level boarding platform until the disabled passenger is on the vehicle and the doors are closed. This section addresses the barriers as they would occur sequentially during this segment of the trip. A checklist of the ADA requirements that address those barriers follows:

#### Checklist of Problems - Specific Design Requirements

- ☐ Between-Car Barriers
- ☐ Signage
- ☐ Public Information System
- ☐ Coordination of Vehicle Floor with Boarding Platform
- ☐ Clear Width of Passenger Doorway at the Boarding Platform
- ☐ Doorway Threshold
- ☐ Vehicle Floor
- ☐ Door Closing Signal
- ☐ Handrails and Stanchions at the Entrance Vestibule

#### ☐ Between Car Barriers

**Problem:** After the train has arrived at the platform, persons with visual impairments may have a difficult time finding where the door opening is located on the platform. The sound of the door opening is a useful clue but may be obscured in a noisy station. One way to find the door opening is to walk along the platform touching the side of train until an opening can be felt. Although use of a cane should detect the vehicle floor to determine whether the opening is a doorway or the space between the cars of the train, the rush of boarding can lead to mistakes. If an error is made, the person could fall off the platform between two cars.

Slides 6, 7 **Solution:** Where rapid rail, light rail and commuter rail vehicles operate in a high platform, level-boarding mode, and where between-car bellows are not provided, devices or systems shall be provided to prevent, deter or warn individuals from inadvertently stepping off the platform between cars. Appropriate devices include, but are not limited to, pantograph gates, chains, motion detectors or other suitable devices.

On rail systems, between-car barriers are not required where platform screens are provided which close off the platform edge and open only when trains are correctly aligned with the doors. Typically, such train screens are used in "people mover" systems. [38.63, 38.85, 38.109]

Between-car barriers are not required on intercity rail systems because they have bellows.



## Signage

**Problem:** The one-car-per-train rule in the DOT regulations requires that at least one car per train be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs. This accessible car must be provided as soon as practicable, but, in no case, later than July 1995. How will a person with a disability know which car is accessible?

**Solution:** The standard which outlines the requirements for accessible doorways on rapid rail, light rail, commuter rail and intercity rail vehicles requires the International Symbol of Accessibility to be displayed on the exterior of all doors which comply with the accessible doorway standards, unless all cars are accessible and are not marked by the access symbol. [38.53(b), 38.73(b), 38.93(e), 38.113(e)]

On commuter rail and intercity rail cars, appropriate signage shall also indicate which accessible doors are adjacent to an accessible restroom, if applicable. [38.93(e), 38.113(e)]

**Problem:** Even though a sign is required to show which doorway is accessible on the rapid rail, light rail, commuter rail, and intercity rail vehicles, it is not clear from the standards that the vehicle will be accessible or if only the doorway and its associated elements are accessible.

**Solution:** The standards do, in fact, require the International Symbol of Accessibility to be placed on the doors that comply with the section of the standard addressing doorways. The Doorway sections address the following elements: Clear Width, Signage, Door Closing Signals, Coordination with Boarding Platform (horizontal gap and vertical height differences between vehicle and platform) for Rapid Rail, Light Rail, Commuter Rail and Intercity Rail vehicles. It should be assumed that if the doorway is signed as accessible, at a minimum, there will be an accessible route to a seat or an area on the vehicle that a wheelchair or mobility-aid can access.

**Problem:** The standards do not explicitly require any signage on the accessible vehicle door that can be read by a blind person. How can a person who is blind tell which door is accessible?

**Solution:** The requirements for accessible doorways apply primarily to persons with mobility impairments. Threshold edge marking is encouraged for existing doors. Although not specifically required, the International Symbol of Accessibility that is required to be displayed on the vehicle doors could be a tactile pictorial symbol sign. The ADA Accessibility Guidelines for Buildings and Facilities (Section 4.30.4) contains standards for tactile signs.

## ☐ Public Information Systems

**Problem:** At the Key transfer stations more than one line operates on the same track and serves the same platform. For example, the Blue and Green lines alternate trains at the same platform. Once you are on the train, you can hear the announcement for the next station stop and from that you can tell what train you are on, but many times it is too late to get off the train before the door has closed. Even though the signs on the trains comply with the standards, a person who is blind or persons with severe visual impairments cannot read the signs.

Slide 8 **Solution:** On rapid rail systems, each vehicle operating in stations having more than one line or route shall have an external public address system to permit transportation system personnel, or recorded or digitized human speech messages, to announce train, route, or line identification information.

Where station announcement systems provide information on arriving trains, an external train speaker is not required. [38.61]

## ☐ Coordination of Vehicle Floor with Boarding Platform

**Problem:** Persons with disabilities, especially persons who use wheelchairs or mobility aids, find it difficult to ride rapid rail, light rail, commuter rail and intercity rail systems even when there is a "level" boarding or a mini-high platform because the gap between the platform and vehicle floor and the difference in elevation between the platform and vehicle floor vary so much from station to station, vehicle to vehicle, and system to system. The new accessibility standards for vehicles address this problem in Sections 38.53(d), 38.73(d), 38.93(d), and 38.113(d). In addition, the ADAAG for Buildings and Facilities addresses this problem in Sections 10.3.1(9) and 10.3.2(4). Both of the standards appear to be consistent but because of all the possible combinations between vehicles (new, existing, and retrofitted) and station platforms (new, existing, key stations) for the various systems (rapid, light, commuter and intercity), it is very difficult to understand the requirements.

Slide 9 **Solution:** There are a number of requirements for each of the different systems. The requirements do have exceptions which have been developed to make it possible to comply with the intent of the ADA legislation. Probably, the easiest way to summarize the variety of scenarios for which specific standards have been promulgated is with a chart which displays the maximum acceptable horizontal gap and vertical elevation difference between new, used and rehabilitated vehicles and new, existing and key station platforms for the various systems. The table follows:

COORDINATION OF VEHICLE FLOOR WITH BOARDING PLATFORM					
SYSTEM	VEHICLE SYND	ADAAG SYND	VEHICLE	PLATFORM	Distance Between Platform and Vehicle Floor Measured at all Doors of all Vehicles when Vehicle is at Rest and Under Normal Passenger Load Unless Noted Otherwise
					HORIZONTAL GAP (NOT GREATER THAN)
					VERTICAL DIFFERENCE (Within Plus or Minus)
Rapid Rail	38.53(d)	10.3.1(9)	New	New	3 in (75 mm)
Rapid Rail	38.53(d)	10.3.2(4)	New	Existing (Key Stations)	5/8 in (16 mm)
Rapid Rail	38.53(d)	----	Retrofitted	New	3 in (75 mm) At Key Stations at one door of each new vehicle
Rapid Rail	38.53(d)	10.3.2(4)	Retrofitted	Existing (Key Stations)	1-1/2 in (38 mm)
					2 in (50 mm) - At 50% passenger load
					2 in (50 mm) - At 50% passenger load
Light Rail	38.73(d)	10.3.1(9)	New	New	2 in (50 mm) - At 50% passenger load
Light Rail	38.73(d)	10.3.2(4)	New	Existing (Key Stations)	5/8 in (16 mm)
Light Rail	38.73(d)	----	Retrofitted	New	1-1/2 in (38 mm)
Light Rail	38.73(d)	10.3.2(4)	Retrofitted	Existing (Key Stations)	2 in (50 mm) - At 50% passenger load
Light Rail	38.73(d)	10.3.1(9)	IF NOT OPERATIONALLY OR STRUCTURALLY POSSIBLE - USE RAMP, BRIDGE, PLATE, OR PORTABLE PLATFORM OR CAR-BORNE LIFT, OR MINI-HIGH PLATFORM		
					2 in (50 mm) - At 50% passenger load

COORDINATION OF VEHICLE FLOOR WITH BOARDING PLATFORM					
SYSTEM	VEHICLE SYND	ADAAG SYND	VEHICLE	PLATFORM	Distance Between Platform and Vehicle Floor Measured at all Doors of all Vehicles when Vehicle is at Rest and Under Normal Passenger Load Unless Noted Otherwise
					HORIZONTAL GAP (NOT GREATER THAN) VERTICAL DIFFERENCE (Within Plus or Minus)
Commuter Rail	38.93(d)	10.3.1(9)	New	New	3 in (75 mm) 5/8 in (16 mm)
Commuter Rail	38.93(d)	10.3.2(4)	New	Existing (Key Station)	3 in (75 mm) At Key Stations: at one door of each new vehicle 1-1/2 in (38 mm)
Commuter Rail	38.93(d)	----	Retrofitted	New	4 in (100 mm) 2 in (50 mm) - At 50% passenger load
Commuter Rail	38.93(d)	10.3.2(4)	Retrofitted	Existing (Key Stations)	4 in (100 mm) 2 in (50 mm) - At 50% passenger load
Commuter Rail	38.93(d)	10.3.1(9) 10.3.2(4)	IF NOT OPERATIONALLY OR STRUCTURALLY POSSIBLE - USE RAMP, BRIDGE PLATE, OR PORTABLE PLATFORM OR CAR-BORNE LIFT, OR MINI-HIGH PLATFORM		
Intercity Rail	38.113(d)	10.3.1(9)	New	New	3 in (75 mm) 5/8 in (16 mm)
Intercity Rail	38.113(d)	----	New	Existing	3 in (75 mm) 1-1/2 in (38 mm)
Intercity Rail	38.113(d)	----	Retrofitted	Existing	4 in (100 mm) 2 in (50 mm) - At 50% passenger load
Intercity Rail	38.113(d)	10.3.1(9) 10.3.2(4)	IF NOT OPERATIONALLY OR STRUCTURALLY POSSIBLE - USE RAMP, BRIDGE PLATE, OR PORTABLE PLATFORM OR CAR-BORNE LIFT, OR MINI-HIGH PLATFORM		

## ☐ Clear Width of Passenger Doorway at Boarding Platform

**Problem:** The critical access control point is the doorway. The clear width of doorways is sometimes a problem on trains for persons who use mobility aids and wheelchairs.

**Solution:** On new rapid rail and light rail vehicles, all passenger doorways on vehicle sides shall have minimum clear openings of 32 in (815 mm) when open. On new commuter rail cars, at least one door, on each side of the car, that opens onto a station platform and that is used for passenger boarding shall have a minimum clear opening of 32 in (815 mm). Each new intercity rail car that is required to be accessible shall have at least one doorway on each side of the car from which passengers board that has a minimum clear width of 32 in (815 mm). [38.53, 38.73, 38.93, 38.113]

Note: Existing commuter and intercity railcars retrofitted to meet the one-car-per-train rule do not need to have wider doors, as long as they can be entered.

## ☐ Doorway Threshold

**Problem:** People with impaired vision find it difficult to see where the platform stops and the threshold at the vehicle doorway begins, especially when the color of the platform is similar to the color of the vehicle floor.

**Solution:** On light rail, commuter rail, and intercity rail vehicles, all thresholds shall have a band of color(s) running the full width of the threshold. The band shall contrast with the adjacent floor, either light-on-dark or dark-on-light.

## ☐ Vehicle Floor

**Problem:** Some floors become quite slippery when they are wet. Others are so smooth that even when they are dry, they are slippery. Are there standards which must be followed on rail vehicles which prescribe what type of material should be used on the floors?

Slide 10 **Solution:** Floor surfaces on aisles, places for standees, and areas where wheelchairs and mobility-aid users are to be accommodated are to be slip-resistant on all rapid rail, light rail, commuter rail and intercity rail vehicles. [38.59, 38.79(a), 38.99(a), 38.117(a)] The appendix recommends that flat surfaces have a static coefficient of 0.6, and ramps have a coefficient of 0.8.



**Problem:** The design of the new rail vehicles calls for carpet on the floor. People who use wheelchairs and mobility aids could have a problem with a carpeted floor especially if the pile of the carpet is very thick. Are there standards that prohibit carpet?

**Solution:** The ADA Accessibility Specifications for Transportation Vehicles does not address carpeted floors. A guideline that could be used is Section 4.5.3 of the ADA Accessibility Guidelines for Buildings and Facilities. Note: If a carpet or carpet tile is used on a ground or floor surface, then it shall be securely attached; have a firm cushion, pad, or backing or no cushion or pad; and have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum pile thickness shall be 1/2 in (13 mm). Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim up to 1/4 in (6 mm) high can be vertical. If the edge trim is between 1/4 in (6 mm) and 1/2 in (13 mm) a bevel with a slope no greater than 1:2 shall be used.

Slide  
11

#### ☐ Door Closing Signal

**Problem:** Many times people who are deaf start to board the train right when the doors start to close. There is an auditory signal to warn other people, but the people who are deaf get no warning. Is there a requirement for auditory door closing signals?

**Solution:** All rapid rail and light rail vehicles shall have auditory and visual warning signals to alert passengers of closing doors. If doors to the platform on commuter rail and intercity rail vehicles close automatically or from a remote location, auditory and visual warning signals shall be provided to alert passengers of closing doors. [38.53(c), 38.73(c), 38.93(c), 38.113(c)]

**Problem:** Visual public announcement systems are generally not available. Is there a specification that covers this?

**Solution:** The ADA Accessibility Specifications for Transportation Vehicles do not contain a detailed specification. Announcements may be provided in a visual format by the use of electronic message boards. Electronic message boards using a light emitting diode (LED) or "flip-dot" display are currently provided in some transit stations and terminals and may be usable in vehicles.

## ☐ Handrails and Stanchions at the Entrance Vestibule

**Problem:** Even though it is easier to board a vehicle from a level boarding platform, people with certain walking disabilities need some support as they enter the vehicle doors. On some vehicles there is no handrail at the doorway. On other vehicles, the stanchions restrict the aisleway for people using wheelchairs or walkers.

**Solution** On rapid and light rail vehicles, handrails and stanchions shall be sufficient to permit safe boarding, onboard circulation, seating and standing assistance, and alighting by persons with disabilities.

On commuter and intercity rail cars handrails or stanchions, where provided within the passenger compartment, shall be placed to permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a seating location from an accessible entrance.

Slide 12 **Problem:** If onboard fare collection is used it is difficult for some people with disabilities to pay the fare especially when the vehicle starts to move. The fare collection device is not designed so a person can easily support himself while paying the fare.

**Solution:** On light rail vehicles where onboard fare collection devices are used, a horizontal passenger assist shall be located between boarding passengers and the fare collection device and shall prevent passengers from sustaining injuries on the fare collection device or windshield in the event of a sudden deceleration. Without restricting the vestibule space, the assist shall provide support for a boarding passenger from the door through the boarding procedure. Passengers shall be able to lean against the assist for security while paying fares.

**Problem:** When handrails and stanchions are required, what are the design parameters for each?

Slide 13 **Solution:** The diameter or width of the gripping surface of handrails and stanchions shall be 1-1/4 in (32 mm) to 1-1/2 in (38 mm) or provide an equivalent gripping surface and have eased edges with corner radii of not less than 1/8 in (3 mm). Handrails shall be placed to provide a minimum 1-1/2 in (38 mm) knuckle clearance from the nearest adjacent surface.



**Note:** The Access Board-sponsored hand anthropometrics research project tested gripping by persons with various hand disabilities and confirmed the appropriateness of the specified dimensions. A 1-inch diameter handrail would not be usable. The Access Board notes that most vehicle handrails are made of pipe. In the building industry, pipe size typically specifies inside diameter so that a 1-1/2 inch pipe handrail actually has a larger outside diameter, sometimes up to 2 inches. Such handrails have not posed any known problem. Thus, the 1-1/2 inch diameter requirement can result in a handrail of approximately 2 inches under current building industry practices. The 1-1/2 inch clearance also received general support.

## EXERCISES

1. The one-car-per-train rule means:
  - (a) At least one car per train must be accessible by July 25, 1995.
  - (b) Disabled people can only ride on one car per train.
  - (c) A level boarding platform must be available for at least one car per train by July 25, 1995.
2. Between-Car Barriers are required
  - (a) Where rapid rail, light rail and commuter rail vehicles operate in a high platform, level boarding mode.
  - (b) On all light rail vehicles.
  - (c) When the distance between the vehicles is greater than 36 in (915 mm).
3. If only one car in the train is accessible, how will a person with a disability know which car it is?
  - (a) The car must be painted a different color.
  - (b) The International Symbol of Accessibility must be displayed on all of the windows of the car.
  - (c) The International Symbol of Accessibility must be displayed on the car doors.
4. What are the standards for the vertical difference between the platform and the door threshold for a retrofitted rapid rail car in a new rapid rail station?
  - (a) 5/8 in (16 mm)
  - (b) 1 in (25 mm)
  - (c) 1-1/2 in (38 mm)
  - (d) 2 in (50 mm)
5. What are the standards for the horizontal gap between the platform and the door threshold for a new rapid rail car in a new rapid rail station?
  - (a) 4 in (100 mm)
  - (b) 3 in (76 mm)
  - (c) 2-1/2 in (64 mm)
  - (d) 6 in (150 mm)

6. The doorway onto a rapid rail and light rail vehicle should be at least \_\_\_\_\_ wide when opened.
- (a) 27 in (685 mm)
  - (b) 30 in (760 mm)
  - (c) 32 in (815 mm)
  - (d) 36 in (915 mm)
7. When the doors on a rapid rail or light rail vehicle close automatically, what type of warning system is required?
- (a) A bell must ring at least three times.
  - (b) An auditory and visual warning signal shall be provided to alert passengers.
  - (c) A flashing red light must be installed inside and outside of the car door.
8. How high from the floor must the handrails be to comply with the ADA standards for handrails in rapid rail and light rail vehicles?
- (a) 72 in (1830 mm)
  - (b) 68 in (1730 mm)
  - (c) 84 in (2130 mm)
  - (d) There is no standard regarding height of handrails in rapid rail and light rail vehicles.

**UNIT 5-3**  
**ACCESSIBLE ROUTE BETWEEN THE BOARDING PLATFORM AND THE**  
**VEHICLE - STEP ENTRY VEHICLES**

**SCOPE**

The Department of Transportation rules implementing the vehicle accessibility requirements of ADA can be found at two levels of detail. The first area which addresses the more general requirements is 49 CFR Part 37, Subpart D - Acquisition of Accessible Vehicles by Public Entities and Subpart E - Acquisition of Accessible Vehicles by Private Entities. The second more specific design criteria is contained in 49 CFR Part 38, ADA Accessibility Specifications for Transportation Vehicles, Subpart D - Light Rail Vehicles and Systems, Subpart E - Commuter Rail Cars and Systems, and Subpart F - Intercity Rail Cars and Systems.

All new, used and remanufactured light rail vehicles, commuter rail and intercity rail cars that were purchased or leased after October 6, 1991, must comply with the Part 38 standards. Those purchased before October 6, 1991, but after August 25, 1990 by a public entity, commuter rail authority or Amtrak must be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs and must comply with interim standards issued by DOT in October 1990.

This unit addresses the elements that must be accessible to permit persons with disabilities to determine which route the specific train serves, to locate the accessible vehicle or car, to determine which door on the vehicle or car is accessible and to board a step entry type vehicle or car before the doors are closed. This unit does not address the barriers encountered by individuals in wheelchairs or mobility aids as they board a step entry vehicle and get settled. That portion of the trip for individuals who use wheelchairs and mobility aids is addressed in Unit 5-4.

## **DEFINITIONS**

### **Slide 1**

**Commuter Rail Car:** A rail passenger car obtained by a commuter authority for use in commuter rail transportation.

### **Slide 2**

**Intercity Rail Passenger Car:** A rail car, intended for use by revenue passengers, obtained by the National Railroad Passenger Corporation (Amtrak) for use in intercity rail transportation.

### **Slide 3**

**Light Rail:** A streetcar-type vehicle operated on city streets, semi-exclusive rights of way, or exclusive rights of way. Service may be provided by step-entry vehicles or by level boarding.

**New Vehicle:** A vehicle which is offered for sale or lease after manufacture without any prior use.

**Used Vehicle:** A vehicle with prior use.

### **Slide 4**

**Remanufactured Vehicle:** A vehicle which has been structurally restored and has had new or rebuilt major components installed to extend its service life.

**Retrofitted Vehicle:** A vehicle that has been modified to the extent necessary to comply with the specific accessibility standards required by the One-Car-Per-Train Rule.

## APPLICABLE STANDARDS

49 CFR 37.79	Purchase or lease of new rail vehicles by public entities operating rapid or light rail systems.
49 CFR 37.81	Purchase or lease of used rail vehicles by public entities operating rapid or light rail systems.
49 CFR 37.83	Remanufacture of rail vehicles and purchase or lease of remanufactured rail vehicles by public entities operating rapid or light rail systems.
49 CFR 37.85	Purchase or lease of new intercity and commuter rail cars.
49 CFR 37.87	Purchase or lease of used intercity and commuter rail cars.
49 CFR 37.89	Remanufacture of intercity and commuter rail cars and purchase and lease of remanufactured intercity and commuter rail cars.
49 CFR 37.93	One-car-per-train rule.
49 CFR 37.101	Purchase or lease of vehicles by private entities not primarily engaged in the business of transporting people.
49 CFR 37.107	Acquisition of passenger rail cars by private entities primarily engaged in the business of transporting people.
49 CFR 38 Subpart D	Light Rail Vehicles and Systems
49 CFR Subpart E	Commuter Rail Cars and Systems
49 CFR Subpart F	Intercity Rail Cars and Systems

## **PROBLEMS AND SOLUTIONS**

Accessibility onto a step entry type light rail vehicle, commuter rail or intercity rail car will be addressed in this unit at two levels of detail: (1) General requirements and (2) Specific design requirements.

### **Checklist of Problems - General Requirements**

- ☐ Accessibility of New and Used Light Rail Vehicles
- ☐ Accessibility of Remanufactured Light Rail Vehicles
- ☐ Accessibility of New and Used Commuter Rail and Intercity Rail Cars
- ☐ Accessibility of Remanufactured Commuter Rail and Intercity Rail Cars
- ☐ One-Car-Per-Train Rule

☐ **Accessibility of New and Used Light Rail Vehicles**

**Problem:** A city has a system which uses light rail vehicles. The existing vehicles are not fully accessible. A procurement is underway to order some used light rail vehicles and some new light rail vehicles. Do these vehicles have to be accessible?

**Solution:** Each public entity operating a light rail system making a solicitation after October 6, 1991 to purchase or lease a used or new light rail vehicle for use on the system shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, and meets the requirements of 49 CFR Part 38.

A public entity may purchase or lease a used light rail vehicle that is not readily accessible after making demonstrated good faith efforts to obtain an accessible vehicle. [37.81]

Note: The entity must nevertheless meet the requirements of the one-car-per-train rule so procurement of inaccessible vehicles, even if permitted, may not be a prudent or cost effective decision.

**Problem:** What are the good faith efforts that must be made when trying to purchase a readily accessible used light rail vehicle? How does the public entity document the good faith efforts?

**Solution:** Good faith efforts shall include at least the following steps:

- (1) The initial solicitation for the used vehicles published by the public entity must specify that all used vehicles were to be accessible to and usable by individuals with disabilities, or, if a solicitation is not used, a documented communication so stating;
- (2) A nationwide search for accessible vehicles, involving specific inquiries to manufacturers and other transit providers; and
- (3) Advertising in trade publications and contacting trade associations.  
[37.81(c)]

Each public entity purchasing or leasing used light rail vehicles that are not readily accessible to and usable by individuals with disabilities shall retain documentation of the specific good faith efforts it made for three years from the date the vehicles were purchased. These records shall be made available, on request, to the FTA Administrator and the public. [37.81(d)]



☐ **Accessibility of Remanufactured Light Rail Vehicles**

**Problem:** A transit authority plans to remanufacture some of its light rail vehicles and purchase some remanufactured light rail vehicles. Do the light rail vehicles have to meet the vehicle accessibility specifications?

**Solution:** Yes, if a light rail vehicle is remanufactured after August 25, 1990, so as to extend its useful life for five years or more, it shall, to the maximum extent feasible be readily accessible to and usable to individuals with disabilities, including individuals who use wheelchairs. [37.83]

It shall be considered feasible to remanufacture a light rail vehicle so as to be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless an engineering analysis demonstrates that doing so would have a significant adverse effect on the structural integrity of the vehicle. [37.83(c)]

**Problem:** One of the light rail lines on a particular system is included on the National Register of Historic Places. The vehicles operated on the lines are considered historic. The vehicles are scheduled to be remanufactured so that the service life can be extended for another seven years. Do these "historic vehicles" have to be made accessible?

**Solution:** If a public entity operates a light rail system any segment of which is included on the National Register of Historic Places and if making a light rail vehicle of historic character used solely on such segment readily accessible to and usable by individuals with disabilities would significantly alter the historic character of such vehicles, the public entity need only make (or purchase or lease a remanufactured vehicle with) those modifications that do not alter the historic character of such vehicles. [37.83(d)]

A public entity operating a fixed route system as described above may apply in writing to the FTA Administrator for a determination of the historic character of the vehicle. The FTA Administrator shall refer such requests to the National Register of Historic Places and shall rely on its advice in making a determination of the historic character of the vehicle. [37.83(e)]

Note: The exception applies only to those vehicles operated solely on a historic segment.

☐ **Accessibility of New and Used Commuter and Intercity Rail Cars**

**Problem:** Do new commuter and intercity rail cars have to be accessible?

**Solution:** Amtrak or a commuter authority making a solicitation after October 6, 1991, to purchase or lease a new intercity or commuter rail car for use on the system shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, complying with the standards in Part 38.

**Problem:** If a public entity purchases used intercity or commuter rail cars, do they have to be accessible? [37.85, 37.87]

**Solution:** Amtrak or a commuter authority purchasing or leasing a used intercity or commuter rail car after October 6, 1991, shall ensure that the car is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

Amtrak or a commuter authority may purchase or lease a used intercity or commuter rail car that is not readily accessible to and usable by individuals with disabilities if, after making demonstrated good faith efforts to obtain an accessible vehicle, it is unable to do so. [37.85, 37.87]

**Problem:** What constitutes "demonstrated good faith efforts" to obtain an accessible vehicle?

**Solution:** Good faith efforts shall include at least the following steps:

- (1) An initial solicitation for the used vehicles published by the commuter authority or Amtrak must specify that all used vehicles were to be accessible to and usable by individuals with disabilities;
- (2) A nationwide search for accessible vehicles, involving specific inquiries to used vehicle dealers and other transit providers; and
- (3) Advertising in trade publications and contacting trade associations.

Amtrak and commuter authorities purchasing or leasing used intercity or commuter rail cars that are not readily accessible to and usable by individuals with disabilities shall retain documentation of the specific good faith efforts it made for three years from the date the vehicles were purchased or leased. These records shall be made available, on request, to the Federal Railroad Administration or FTA Administrator, as applicable. These records shall be made available to the public, on request. [37.87]

☐ **Accessibility of Remanufactured Commuter and Intercity Rail Cars**

**Problem:** If a commuter rail car or an intercity rail car is scheduled to be remanufactured, does the scope of the remanufacturing project have to address all of the accessibility specifications?

**Solution:** If Amtrak or a commuter rail authority remanufactures or purchases or leases a remanufactured car which has its life extended by ten years or more, the commuter rail and intercity rail cars shall, to the maximum extent feasible, be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

It shall be considered feasible to remanufacture an intercity or commuter rail car so as to be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless an engineering analysis demonstrates that remanufacturing the car to be accessible would have a significant adverse effect on the structural integrity of the car. [37.89]

☐ **One-Car-Per-Train Rule**

**Problem:** What is the One-Car-Per-Train Rule and what are the dates for implementation?

**Solution:** Each public entity providing rapid or light rail service shall ensure that each train, consisting of two or more vehicles, includes at least one car that is readily accessible as soon as practicable but in no case later than July 25, 1995. Each entity providing intercity rail service and each commuter rail authority shall ensure that each train has one car that is readily accessible as soon as practicable but in no case later than July 26, 1995. [37.93]

**Problem:** If a commuter, light or rapid rail system has vehicles or cars which were considered accessible under previous DOT rules, but do not fully meet all of the standards in Part 38, can they be used to meet the one-car-per-train rule?

**Solution:** Yes, provided they can be entered and used from stations in which they are to be operated.

Problems and solutions related to specific design requirements address those barriers that a person with a disability encounters between the time the light rail vehicle or light rail, commuter rail or intercity rail train arrives at the stop or station until the passenger with the disability is on the vehicle and the doors are closed. This section addresses the barriers as they would be encountered as the disabled person completes this segment of the trip. A checklist of the ADA requirements that address those barriers follows:

#### Checklist of Problems - Specific Design Requirements

- ☐ Signage
- ☐ Clear Width of Passenger Doorway
- ☐ Steps and Thresholds
- ☐ Lighting
- ☐ Vehicle Floor
- ☐ Door Closing Signal
- ☐ Handrails and Stanchions at the Entrance Vestibule

#### ☐ Signage

**Problem:** The one-car-per-train rule in the DOT regulations requires that at least one car per train is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs. This accessible car must be provided as soon as practicable, but, in no case, later than July 1995. How will a disabled person know which car is accessible?

Slide 5 **Solution:** The standard which outlines the requirements for accessible doorways on light rail, commuter rail and intercity rail vehicles requires the International Symbol of Accessibility to be displayed on the exterior of all doors which comply with the accessible doorway standards, unless all cars are accessible and are not marked by the access symbol. [38.73(b), 38.93(e), 38.113(e)]

On commuter rail and intercity rail cars, appropriate signage shall also indicate which accessible doors are adjacent to an accessible restroom, if applicable. [38.93(e), 38.113(e)]

**Problem:** Even though a sign is required to show which doorway is accessible on the light rail, commuter rail, and intercity rail vehicles, it is not clear from the standards that the vehicle will be accessible or if only the doorway and its associated elements are accessible.

**Solution:** The standards do, in fact, require the International Symbol of Accessibility to be placed on the doors that comply with the section of the standard addressing doorways. The Doorway sections address the following elements: Clear Width, Signage, Door Closing Signals, Coordination with Boarding Platform (horizontal gap and vertical height differences between vehicle and platform) for Light Rail, Commuter Rail and Intercity Rail vehicles. At all doors on level-entry vehicles, and at each entrance accessible by lift, ramp, bridge plate or other suitable means, handrails, stanchions, passenger seats, vehicle driver seat platforms, and fare boxes, if applicable, shall be located so as to allow a route at least 32 in (815 mm) wide so that at least two wheelchairs or mobility aid users can enter the vehicle and position the wheelchairs or mobility aids in areas, each having a minimum clear space of 48 in by 30 in (1220 mm by 760 mm), which do not unduly restrict movement of other passengers. Space to accommodate wheelchairs and mobility aids may be provided within the normal area used by standees and designation of specific spaces is not required. Particular attention shall be given to ensuring maximum maneuverability immediately inside doors. Ample vertical stanchions from ceiling to seatback rails shall be provided. Vertical stanchions from ceiling to floor shall not interfere with wheelchair or mobility aid circulation and shall be kept to a minimum in the vicinity of accessible doors. [38.77]

#### ☐ Clear Width of Passenger Doorway at Boarding Platform

Slide 6 **Problem:** The critical access control point is the doorway. The clear width of doorways is sometimes a problem on trains for persons who use mobility aids and wheelchairs.

**Solution:** On light rail vehicles, all passenger doorways on vehicle sides shall have minimum clear openings of 32 in (815 mm) when open. On commuter rail cars, at least one door, on each side of the car, that opens onto a station platform and that is used for passenger boarding shall have a minimum clear opening of 32 in (815 mm). Each intercity rail car that is required to be accessible shall have at least one doorway on each side of the car from which passengers board that has a minimum clear width of 32 in (815 mm). [38.73, 38.93, 38.113] For new rail cars where entry is through a vestibule, the vestibule must be a minimum of 42 in (1065 mm) wide.

## ☐ Steps and Thresholds

**Problem:** When it rains and snows the steps on the light rail vehicles and the steps on the commuter rail and intercity rail cars get wet. Some of the smooth surfaces on the steps become quite slippery.

Slide **Solution:** All step treads on light rail vehicles, commuter rail and intercity rail cars  
7 shall be slip resistant. [38.79(a), 38.99(a), 38.117(a)]

**Problem:** In developing a specification for a slip resistant surface, what standard should be used to ensure that the surface complies with ADA requirements?

**Solution:** There is no specific requirement but advisory guidance is provided in the appendix. The coefficient of friction is the descriptor used to measure slip resistance. The coefficient of friction is the ratio between the force necessary to move one surface over another surface and the pressure between the two surfaces. For example, the coefficient of friction for cast iron on oak is 38:100 or 0.38. A research project conducted with persons with disabilities concluded that a static coefficient of friction of 0.60 was appropriate for steps, floors and lift platforms and a coefficient of friction of 0.80 was desirable for ramps.

**Problem:** It is difficult for people with low vision to distinguish when they are at the edge of a step or when they are approaching a threshold.

Slide **Solution:** All step edges and thresholds on light rail vehicles, commuter rail and  
8 intercity rail cars shall have a band of color(s) running the full width of the step or threshold which contrasts from the step tread and riser or adjacent floor, either light-on-dark or dark-on-light. [38.79(b), 38.99(b), 38.117(b)]

There is no specific requirement for contrast but the ADAAG appendix recommends that the material used contrast by at least 70%. Percent contrast is determined by the following equation:

$$\text{Contrast} = \frac{B_1 - B_2}{B_1} \times 100$$

where  $B_1$  is the Light Reflectance Value of the lighter area and  $B_2$  is the Light Reflectance Value of the darker area. Note that in any application both white and black are never absolute: thus  $B_2$  never equals 100 and  $B_1$  is always greater than zero. [Appendix Part 38]

☐ **Lighting**

**Problem:** When boarding a light rail vehicle, commuter rail or intercity rail car at stops or stations where the steps must be used and where there are no lights on the platform area and or at the stop, it is difficult to see in the area immediately outside of the doors.

Slide 9 **Solution:** The doorways of vehicles not operating at lighted station platforms shall have outside lights which provide at least 1 footcandle (11 lux) of illumination on the station platform or street surface for a distance of 36 in (915 mm) perpendicular to all points on the bottom step tread. Such lights shall be located below window level and shielded to protect the eyes of entering and exiting passengers. [38.81, 38.101, 38.119]

**Problem:** Even though the ground surface or the platform surface outside of the light rail vehicle, commuter rail or intercity rail vehicle is lighted when the doors are open, it is difficult to see the step treads. When the lift or ramp is deployed, it is difficult to see the lift platform or ramp surface because there is very little light shining on those surfaces.

**Solution:** Any stepwell or doorway with a lift or ramp immediately adjacent to the driver shall have, when the door is open, at least 2 footcandles (22 lux) of illumination measured on the step tread or lift platform. [38.81(a), 38.101(a), 38.119(a)]

Other stepwells and doorways with lifts or ramps shall have, at all times, at least 2 footcandles (22 lux) of illumination measured on the step tread or lift or ramp, when deployed at the vehicle floor level. [38.81(b)]



☐ **Vehicle Floor**

**Problem:** Some floors become quite slippery when they are wet. Others are so smooth that even when they are dry, they are slippery. Are there standards which must be followed on rail vehicles which prescribe what type of material should be used on the floors?

Slide 10 **Solution:** Floor surfaces on aisles, places for standees, and areas where wheelchairs and mobility-aid users are to be accommodated are to be slip-resistant on all light rail, commuter rail and intercity rail vehicles. [38.79(a), 38.99(a), 38.117(a)]

Note: Appendix to Part 38 recommends the coefficient of friction as the appropriate descriptor to measure slip resistance.

**Problem:** The design of the new rail vehicles calls for carpet on the floor. People who use wheelchairs and mobility aids could have a problem with a carpeted floor especially if the pile of the carpet is very thick. Are there standards that prohibit carpet?

Slide 11 **Solution:** The ADA Accessibility Specifications for Transportation Vehicles does not specifically address carpeted floors. A guideline that could be used is Section 4.5.3 of the ADA Accessibility Guidelines for Buildings and Facilities which states: If a carpet or carpet tile is used on a ground or floor surface, then it shall be securely attached; have a firm cushion, pad, or backing or no cushion or pad; and have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum pile thickness shall be 1/2 in (13 mm). Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim up to 1/4 in (6 mm) high can be vertical. If the edge trim is between 1/4 in (6 mm) and 1/2 in (13 mm) a bevel with a slope no greater than 1:2 shall be used. Some carpet can be "slippery" when wet, so specify with care.

☐ **Door Closing Signal**

**Problem:** Many times people who are deaf start to board the train right when the doors start to close. There is an auditory signal to warn other people, but the people who are deaf get no warning. Is there a requirement regarding door closing signals?

**Solution:** All light and rapid rail vehicles shall have auditory and visual warning signals to alert passengers of closing doors. If doors to the platform on commuter rail and intercity rail vehicles close automatically or from a remote location, auditory and visual warning signals shall be provided to alert passengers of closing doors. [38.73(c), 38.93(c), 38.113(c)]



**Problem:** Visual door closing signals are generally not available. Is there a specification that covers this?

**Solution:** A light at the door which flashes in synchronization with the door chime would suffice. Such a signal needs to be visible from the platform as well as inside the vehicle. A bright light which raises the overall illumination of the doorway could be provided.

☐ **Handrails and Stanchions at the Entrance Vestibule**

Slide 12 **Problem:** When boarding a light rail vehicle, it is difficult to reach up and grasp the handrail as you negotiate the first step.

**Solution:** Handrails and Stanchions on light rail vehicles shall be sufficient to permit safe boarding assistance and alighting by persons with disabilities. [38.77(a)] At entrances equipped with steps on light rail vehicles, handrails and stanchions shall be provided in the entrance to the vehicle in a configuration which allows passengers to grasp such assists from outside the vehicle while starting to board, and to continue using such handrails or stanchions throughout the boarding process. [38.77(b)]

**Problem:** If onboard fare collection is used it is difficult for some people with disabilities to pay the fare especially when the vehicle starts to move. The fare collection device is not designed so a person can easily support himself while paying the fare.

**Solution:** On light rail vehicles where onboard fare collection devices are used, a horizontal passenger assist shall be located between boarding passengers and the fare collection device and shall prevent passengers from sustaining injuries on the fare collection device or windshield in the event of a sudden deceleration. Without restricting the vestibule space, the assist shall provide support for a boarding passenger from the door through the boarding procedure. Passengers shall be able to lean against the assist for security while paying fares.

**Problem:** When handrails and stanchions are required, what are the design parameters for each?

**Solution:** The diameter or width of the gripping surface of handrails and stanchions shall be 1-1/4 in (32 mm) to 1-1/2 in (38 mm) or provide an equivalent gripping surface and have eased edges with corner radii of not less than 1/8 in (3 mm). Handrails shall be placed to provide a minimum 1-1/2 in (38 mm) knuckle clearance from the nearest adjacent surface.

Note: The Access Board-sponsored hand anthropometrics research project tested gripping by persons with various hand disabilities and confirmed the appropriateness of the specified dimensions. A 1-inch diameter handrail would not be usable. The Access Board notes that most vehicle handrails are made of pipe. In the building industry, pipe size typically specifies inside diameter so that a 1-1/2 inch pipe handrail actually has a larger outside diameter, sometimes up to 2 inches. Such handrails have not posed any known problem. Thus, the 1-1/2 inch diameter requirement can result in a handrail of approximately 2 inches under current building industry practices. The 1-1/2 inch clearance also received general support.

## EXERCISES

1. The one-car-per-train rule means:
  - (a) Disabled people can only ride on one car per train.
  - (b) At least one car per train must be accessible by July 25, 1995.
  - (c) Only one-car-trains can be used to transport persons with disabilities.
2. Light rail step entry vehicles are being remanufactured and the remanufacture process will extend the life of the vehicles approximately 10 years. There are no barriers between car barriers on the existing vehicles. Are barriers required by ADA?
  - (a) Yes
  - (b) No
3. A light rail transit authority is retrofitting its vehicles to comply with the ADA One-Car-Per-Train Rule. What section of the standards would you research to determine what elements must be retrofitted to make the vehicle accessible?
4. What is the level of lighting required on the steps as you enter the step entry vehicle?
  - (a) 2 footcandles (22 lux)
  - (b) 1 footcandle (11 lux)
  - (c) 5 footcandles (55 lux)
  - (d) No light is required.
5. What is the recommended percent of contrast between the color of a threshold and the color of the adjacent floor surfaces to ensure that people with low vision can see the threshold?
  - (a) 100%
  - (b) 25%
  - (c) 85%
  - (d) 70%
6. How wide should the entry doorway be on a light rail step entry vehicle?
  - (a) 27 in (685 mm)
  - (b) 30 in (760 mm)
  - (c) 32 in (815 mm)
  - (d) 36 in (915 mm)

## UNIT 5-4

### ACCESSIBLE ROUTE BETWEEN THE BOARDING PLATFORM AND THE VEHICLE - MOBILITY AIDS ACCESSIBILITY AND SECUREMENT DEVICES

#### SCOPE

The Department of Transportation rules implementing the vehicle accessibility requirements of ADA can be found at two levels of detail. The first area which addresses the more general requirements is 49 CFR Part 37, Subpart D - Acquisition of Accessible Vehicles by Public Entities and Subpart E - Acquisition of Accessible Vehicles by Private Entities. The second more specific design criteria is contained in 49 CFR Part 38, ADA Accessibility Specifications for Transportation Vehicles, Accessibility Specifications for Transportation Vehicles, Subpart B - Buses, Vans and Systems, Subpart D - Light Rail Vehicles and Systems, Subpart E - Commuter Rail Cars and Systems, and Subpart F - Intercity Rail Cars and Systems.

This unit addresses the barriers that may be encountered as a person with a disability uses a wheelchair lift, ramp or bridge plate to board a bus, van, light rail, commuter rail or intercity rail vehicle and as that person is secured at the securement area on board a bus or van.

This unit is divided into three parts, namely, Platform Lifts, Ramps or Bridge Plates and Securement Devices. Each part addresses the specific design requirements for that particular mobility aid with a series of problems (barriers) that could be encountered by an individual who is disabled. Solutions to the specific problems are presented. The solutions are a statement of the design specifications that are required to make the system accessible to individuals with disabilities, including individuals who use wheelchairs.

## DEFINITIONS

**Wheelchair:** A mobility aid belonging to any class of three or four-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered. A "common wheelchair" is such a device which does not exceed 30 in (760 mm) in width and 48 in (1220 mm) in length measured 2 in (50 mm) above the ground, and does not weigh more than 600 pounds (272 kg) when occupied.

Slides 1, 2, 3

**Platform Lift:** A horizontal surface that is raised to a higher position and is used to transport objects from one level to another.

Slides 4, 5

**Ramp:** A sloping surface joining different levels. A walking surface that has a running slope greater than 1:20.

Slide 6

**Bridge Plate:** A stowable, relatively thin piece of metal or other material that provides a connection or transition over a gap or between two different levels which provides a way across for a pedestrian or a mobility aid user.

Slide 7

**Securement Device:** A mechanical contrivance used to restrain a mobility aid to protect it from moving during transit.

## APPLICABLE STANDARDS

49 CFR 38.23	Mobility Aid Accessibility, Buses, Vans and Systems
49 CFR 38.83	Mobility Aid Accessibility, Light Rail Vehicles and Systems
49 CFR 38.95	Mobility Aid Accessibility, Commuter Rail Cars and Systems
49 CFR 38.125	Mobility Aid Accessibility, Intercity Rail Cars and Systems

## PLATFORM LIFTS

Slides 8, 9

Platform lifts or wheelchair lifts can be used on buses, vans, light rail, commuter rail, and intercity rail vehicles. The requirements for all of these vehicles are generally the same. There are some instances where requirements for a particular vehicle type are different. These will be addressed and specific requirements will be presented. The following elements must meet specific specifications in order for the platform lift to be accessible.

### Checklist of Problems - Specific Design Requirements

- ☐ Design Load
- ☐ Controls
- ☐ Emergency Operation/Power or Equipment Failure
- ☐ Platform Barriers
- ☐ Platform Surface (Texture and Size)
- ☐ Platform Gaps
- ☐ Platform Entrance Ramp
- ☐ Platform Deflection
- ☐ Platform Movement and Boarding Direction
- ☐ Use By Standees
- ☐ Handrails

### ☐ Design Load

**Problem:** There are various sizes and weights of wheelchairs. Some of the motorized wheelchairs appear to be quite heavy, and when occupied by a person who could possibly weigh over two-hundred pounds, the load capacity of a platform lift could affect accessibility. How much of a load must a platform lift be able to transport to be in compliance with the specifications?

**Solution:** The design load of the lift shall be at least 600 pounds (272 kg). Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Nonworking parts, such as platform, frame, and attachment hardware which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material. [38.23(b)(1), 38.83(b)(1), 38.95(b)(1), 38.125(b)(1)]

## ☐ Controls

Slide 10 **Problem:** When the platform lift is onboard the vehicle, what prevents the vehicle from starting to move, even by accident, while the lift is being deployed? How can a person with a disability be assured that the lift is safe and will not go into a stowage location before he or she exits the platform?

**Solution:** The controls shall be interlocked with the vehicle brakes, propulsion system (rail cars), transmission (vans, buses), or door, or shall provide other appropriate mechanisms or systems, to ensure that the vehicle cannot be moved when the lift is not stowed and so the lift cannot be deployed unless the interlocks or systems are engaged. The lift shall deploy to all levels normally encountered in the operating environment. Where provided, each control for deploying, lowering, raising, and stowing the lift and lowering the roll-off barriers shall be of a momentary contact type requiring continuous manual pressure by the operator and shall not allow improper lift sequencing when the lift platform is occupied. The controls shall allow reversal of the lift operation sequence, such as raising or lowering a platform that is part way down, without allowing an occupied platform to fold or retract into the stowed position. [38.23(b)(2), 38.83(b)(2), 38.95(b)(2), 38.125(b)(2)]

**Problem:** Are there any exceptions to the design specifications for controls stated in the above solution?

**Solution:** For vans and buses, where the lift is designed to deploy with its long dimension parallel to the vehicle axis and which pivots into or out of the vehicle while occupied (i.e., "rotary lift"), the requirements of this paragraph prohibiting the lift from being stowed while occupied shall not apply if the stowed position is within the passenger compartment and the lift is intended to be stowed while occupied.

For light rail, commuter rail, and intercity rail cars, where physical or safety constraints prevent the deployment at some stops of a lift having its long dimension perpendicular to the car axis, the transportation entity may specify a lift which is designed to deploy with its long dimension parallel to the car axis and which pivots into or out of the car while occupied (i.e., "rotary lift"). The requirements stated in the above Problem/Solution prohibiting the lift from being stowed while occupied shall not apply to a lift design of this type if the stowed position is within the passenger compartment and the lift is intended to be stowed while occupied.

The brake or propulsion system interlocks requirement does not apply to platform mounted or portable lifts provided that a mechanical, electrical or other system operates to ensure that cars do not move when the lift is in use. [38.83(b)(2), 38.95(b)(2), 38.125(b)(2)]

Note: "Other system" could be a door interlock which prevents the vehicle from moving when the door is open.

☐ **Emergency Operation/Power or Equipment Failure**

**Problem:** If the power supply to the platform lift fails when the lift is deployed, how will the person with the disability be removed from the platform?

**Solution:** The lift shall incorporate an emergency method of deploying, lowering to ground or station platform level with a lift occupant, and raising and stowing the empty lift if the power to the lift fails. No emergency method, manual or otherwise, shall be capable of being operated in a manner that could be hazardous to the lift occupant or to the operator when operated according to the manufacturer's instructions. No emergency method shall permit the platform to be stowed or folded when occupied, unless the lift is a rotary lift and is intended to be stowed while occupied. Platforms stowed in a vertical position, and deployed platforms when occupied, shall have provisions to prevent their deploying, failing, or folding any faster than 12 in/sec (300 mm/sec) or their dropping of an occupant in the event of a single failure of any load carrying component. [38.23(b)(3)(4), 38.83(b)(3)(4), 38.95(b)(3)(4), 38.125(b)(3)(4)]

☐ **Platform Barriers**

Slide 11 **Problem:** Once on the lift platform, what type of barrier or edge protection should there be to ensure that the wheelchair does not go over the side or roll forward or backward off the platform surface?

**Solution:** The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair or mobility aid from rolling off the lift during its operation. A movable barrier or inherent design feature shall prevent a wheelchair or mobility aid from rolling off the edge closest to the vehicle until the lift is in its fully raised position. Each side of the lift platform which, in its raised position, extends beyond the vehicle shall have a barrier a minimum 1-1/2 in (38 mm) high. Such barriers shall not interfere with maneuvering into or out of the vehicle. The loading-edge barrier (outer barrier) which functions as a loading ramp when the lift is at ground or station platform level, shall be sufficient when raised or closed, or a supplementary system shall be provided, to prevent a power wheelchair or mobility aid from riding over or defeating it. The outer barrier of the lift shall automatically rise or close, or a supplementary system shall automatically engage, and remain raised, closed, or engaged at all times that the lift platform is more than 3 in (75 mm) above the station platform and the lift is occupied. Alternatively, a barrier or system may be raised, lowered, opened, closed, engaged or disengaged by the lift operator provided an interlock or inherent design feature prevents the lift from rising unless the barrier is raised or closed or the supplementary system is engaged. [38.23(b)(5), 38.83(b)(5), 38.95(b)(5), 38.125(b)(5)]



☐ **Platform Surface (Texture and Size)**

**Problem:** Some surfaces are very smooth and slippery when they get wet, and others are quite rough, which makes it difficult to walk and stand on. Is there a design requirement for the platform surface texture?

The size of the platform is very important especially for some of the new, larger mobility aids. Is there a minimum size for the platform on the lift?

- Slide 12 **Solution:** The lift platform surface shall be free of any protrusions over 1/4 in (6 mm) high and shall be slip resistant. The lift platform shall have a minimum clear width of 28-1/2 in (724 mm) at the platform, a minimum clear width of 30 in (760 mm) measured from 2 in (50 mm) above the lift platform surface to 30 in (760 mm) above the surface, and a minimum clear length of 48 in (1220 mm) measured from 2 in (50 mm) above the surface of the platform to 30 in (760 mm) above the surface. [38.23(b)(6), 38.83(b)(6), 38.95(b)(6), 38.125(b)(6)]

☐ **Platform Gaps**

**Problem:** Some of the openings or cracks around the edges of the lift platform between the platform surface and the edge protection barrier are quite wide. A wheel on the wheelchair could get caught in the crack and someone could get hurt. The gap between the edge of the platform and vehicle floor is often very wide and sometimes there is quite a vertical difference between the platform surface and the vehicle floor. Are there any standards for these gaps?

- Slide 13 **Solution:** Any openings between the lift platform surface and the raised barriers shall not exceed 5/8 in (16 mm) wide. When the lift is at car floor height with the inner barrier (if applicable) down or retracted, gaps between the forward lift platform edge and vehicle floor shall not exceed 1/2 in (12 mm) horizontally and 5/8 in (16 mm) vertically. Platforms on semi-automatic lifts may have a hand hold not exceeding 1-1/2 in (38 mm) by 4-1/2 in (115 mm) located between the edge barriers. [38.23(b)(7), 38.83(b)(7), 38.95(b)(7), 38.125(b)(7)]

**Note:** The 5/8 in (16 mm) maximum gap between raised barriers and platform is not a requirement for the platform itself; expanded metal platforms are not precluded.

☐ **Platform Entrance Ramp**

Slide 14 **Problem:** The slope of the ramp that leads onto the platform is a critical part of the trip. Is there a maximum slope that is allowable? What about the vertical distance between the ramp and the sidewalk or platform surface? Is there a maximum height before some type of beveled threshold must be used? If a threshold is used, is there a standard for the threshold design?

**Solution:** The entrance ramp, or loading-edge barrier used as a ramp, shall not exceed a slope of 1:8, when measured on level ground, for a maximum rise of 3 in (75 mm) and the transition from the roadway, sidewalk or station platform to ramp may be vertical without edge treatment up to 1/4 in (6 mm). Thresholds between 1/4 in (6 mm) and 1/2 in (13 mm) high shall be beveled with a slope no greater than 1:2. [38.23(b)(8), 38.83(b)(8), 38.95(b)(8), 38.125(b)(8)]

☐ **Platform Deflection**

**Problem:** In designing the platform of the lift, what is the maximum amount of deflection that is acceptable? Since the weight must be considered, the thinner the material that can be used on the platform, the better, but thinner materials will likely deflect more.

**Solution:** The lift platform (not including the entrance ramp) shall not deflect more than 3 degrees (exclusive of vehicle roll or pitch) in any direction between its unloaded position and its position when loaded with 600 pounds (272 kg) applied through a 26 in (660 mm) by 26 in (660 mm) test pallet at the centroid of the lift platform. [38.23(b)(9), 38.83(b)(9), 38.95(b)(9), 38.125(b)(9)]

**Note:** The centroid is the center of mass which, in most cases, will be close to the geometric center of the platform.

☐ **Platform Movement and Boarding Direction**

**Problem:** Is there a maximum safe speed for the movement of the platform from the street or platform level to the vehicle floor level? Is a faster speed more acceptable to speed up the boarding process? Is there a maximum acceleration rate? What is the preferred boarding direction? Some individuals would rather back onto the ramp and platform. Is this permissible?

**Solution:** No part of the platform shall move at a rate exceeding 6 in/sec (150 mm/sec) during lowering and lifting an occupant, and shall not exceed 12 in/sec (305 mm/sec) during deploying or stowing. This requirement does not apply to the deployment or stowage cycle of lifts that are manually deployed or stowed. The maximum platform horizontal and vertical acceleration when occupied shall be 0.3g. The lift shall permit both inboard and outboard facing of wheelchairs and mobility aids. [38.23(b)(10)(11), 38.83(b)(10)(11), 38.95(b)(10)(11), 38.125(b)(10)(11)]

☐ **Use By Standees**

**Problem:** Many people who cannot climb steps and people who are on crutches or use walkers have a difficult time boarding a step entry vehicle. Can the platform lift be used safely by those individuals?

**Solution:** Lifts shall accommodate persons using walkers, crutches, canes or braces or who otherwise have difficulty using steps. The lift may be marked to indicate a preferred standing position. [38.23(b)(12), 38.83(b)(12), 38.95(b)(12), 38.125(b)(12)]

**Note:** Several transit agencies have initiated successful programs to allow standees to use lifts with no reported problems. [FTA Study]

## ☐ Handrails

Slide 15 **Problem:** When people use the platform lift, especially persons who stand on the platform, there must be something to hold on to when the lift is in motion. Are there specific design specifications for handrails?

**Solution:** Platforms on lifts shall be equipped with handrails, on two sides, which move in tandem with the lift, and which shall be graspable and provide support to standees throughout the entire lift operation. Handrails shall have a usable component at least 8 in (200 mm) long with the lowest portion a minimum 30 in (760 mm) above the platform and the highest portion a maximum 38 in (965 mm) above the platform. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1-1/4 in (32 mm) and 1-1/2 in (38 mm) or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than 1/8 in (3 mm). Handrails shall be placed to provide a minimum 1-1/2 in (38 mm) knuckle clearance from the nearest adjacent surface. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle. [38.23(b)(13), 38.83(b)(13), 38.95(b)(13), 38.125(b)(13)]

## VEHICLE RAMPS OR BRIDGE PLATES

Slides 16, 17

Vehicle ramps or bridge plates can be used on buses, vans, light rail, commuter rail and intercity rail vehicles. The requirements for all of the vehicles are similar. There are particular situations where the slope of the ramp is affected by vehicle loading and the variety of areas where the ramp must be deployed. These situations are addressed and specific requirements are presented.

### Checklist of Problems - Specific Design Requirements

- ☐ Design Load
- ☐ Surface
- ☐ Threshold
- ☐ Edge Protection
- ☐ Slope
- ☐ Attachment
- ☐ Stowage
- ☐ Handrails

#### ☐ Design Load

**Problem:** Some of the metal ramps used for boarding transit vehicles are longer than others to accommodate the slope requirements. There are so many different types of wheelchairs and mobility aids. Some appear to be quite heavy with all the batteries and other paraphernalia. It seems like some of the longer ramps may not be strong enough to support the heavier mobility aids. Are there some general guidelines regarding length and size of load for ramps?

**Solution:** Ramps or bridge plates 30 in (760 mm) or longer shall support a load of 600 pounds (272 kg), placed at the centroid of the ramp or bridge plate distributed over an area of 26 in (660 mm) by 26 in (660 mm), with a safety factor of at least 3 based on the ultimate strength of the material. Ramps or bridge plates shorter than 30 in (760 mm) shall support a load of 300 pounds (136 kg). [38.23(c)(1), 38.83(c)(1), 38.95(c)(1), 38.125(c)(1)]

**Note:** For a "short" ramp or bridge plate, only the front or rear wheels of a common wheelchair or mobility aid will be on the surface at any one time, hence, half the load. No specific measurement technique is prescribed.

## ☐ Surface

**Problem:** It is important that the ramp be slip resistant, especially when it is wet. One way to obtain a slip resistant surface is to use a material that has protrusions or "small bumps" all over the surface. If the "bumps" are too large, the surface is very difficult to negotiate, especially when the ramp is at its maximum slope.

Slide 18 **Solution:** The ramp or bridge plate surface shall be continuous and slip resistant, shall not have protrusions from the surface greater than 1/4 in (6 mm) high, shall have a clear width of 30 in (760 mm) and shall accommodate both four-wheel and three-wheel mobility aids. [38.23(c)(2), 38.83(c)(2), 38.95(c)(2), 38.125(c)(2)]

Note: Two ramps placed side by side with a gap in the middle will not accommodate a 3-wheel scooter. Expanded metal or perforated ramps are permitted.

## ☐ Threshold

**Problem:** Sometimes getting on the ramp is difficult because the edge of the ramp does not have a smooth transition with the platform or sidewalk surface. What is the maximum vertical difference before some type of threshold or beveled edge treatment is required?

**Solution:** The transition from the boarding surface (sidewalk, street or station platform) to the ramp or bridge plate and the transition from vehicle floor to the ramp or bridge plate may be vertical without edge treatment up to 1/4 in (6 mm). Changes in level between 1/4 in (6 mm) and 1/2 in (13 mm) shall be beveled with a slope no greater than 1:2. [38.23(c)(3), 38.83(c)(3), 38.95(c)(3), 38.125(c)(3)]

## ☐ Edge Protection

Slide 19 **Problem:** Ramps are required to be 30 in (760 mm) wide. This is a sufficient width for most wheelchairs and mobility aids, but for some, it doesn't leave a lot of room on either side of the ramp. It's possible for a wheelchair to go off to the right or left a little bit and fall off the ramp. Is there a requirement that some type of barrier be placed along the edge of the ramp?

**Solution:** Each side of the ramp or bridge plate shall have barriers at least 2 in (50 mm) high to prevent mobility aid wheels from slipping off. [38.23(c)(4), 38.83(c)(4), 38.95(c)(4), 38.125(c)(4)]

## ☐ Slope

**Problem:** The slope of a ramp depends on where it is deployed. For buses and vans, the locations where a ramp can be deployed vary widely. For light rail, commuter rail and intercity rail vehicles, the conditions are somewhat controlled. The loading of the vehicle would change the floor elevation and this could change the ramp slope, especially for those vehicles that service the same platform areas.

**Solution:** For buses and vans, ramps shall have the least slope practicable and shall not exceed 1:4 when deployed to ground level. If the height of the vehicle floor from which the ramp is deployed is 3 in (75 mm) or less above a 6-in (150-mm) curb, a maximum slope of 1:4 is permitted; if the height of the vehicle floor from which the ramp is deployed is 6 in (150 mm) or less, but greater than 3 in (75 mm), above a 6-in (150-mm) curb, a maximum slope of 1:6 is permitted; if the height of the vehicle floor from which the ramp is deployed is 9 in (225 mm) or less, but greater than 6 in (150 mm), above a 6-in (150-mm) curb, a maximum slope of 1:8 is permitted; if the height of the vehicle floor from which the ramp is deployed is greater than 9 in (225 mm) above a 6-in (150-mm) curb, a slope of 1:12 shall be achieved. Folding or telescoping ramps are permitted provided they meet all structural requirements of this section. [38.23(c)(5)]

For light rail, commuter rail and intercity rail vehicles, ramps or bridge plates shall have the least slope practicable. If the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 3 in (75 mm) or less above the station platform a maximum slope of 1:4 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 6 in (150 mm) or less, but more than 3 in (75 mm), above the station platform a maximum slope of 1:6 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 9 in (225 mm) or less, but more than 6 in (150 mm), above the station platform a maximum slope of 1:8 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is greater than 9 in (225 mm) above the station platform a slope of 1:12 shall be achieved. Folding or telescoping ramps are permitted provided they meet all structural requirements of this section. [38.83(c)(5), 38.95(c)(5), 38.125(c)(5)]

### Permissible Ramp Slope

Height of Vehicle Floor above Station Platform with 50% Loading	Maximum Permissible Ramp Slope
0 in (0 mm) to 3 in (75 mm)	1:4
3 in (75 mm) to 6 in (150 mm)	1:6
6 in (150 mm) to 9 in (225 mm)	1:8
Greater than 9 in (225 mm)	1:12



☐ **Attachment**

**Problem:** Depending on how the ramp is attached to the vehicle, it can seem like it is quite loose and can move from side to side. Also, the gap between the ramp and the vehicle on some installations appears to be quite large. What are the requirements for ramp attachment? Are there any requirements which limit the size of the gap?

**Solution:** When in use for boarding or alighting, the ramp or bridge plate shall be attached to the vehicle, or otherwise prevented from moving such that it is not subject to displacement when loading or unloading a heavy power mobility aid and that any horizontal gaps between vehicle and ramp or bridge plate, and station platform and ramp or bridge plate, shall not exceed 5/8 in (16 mm). [38.23(c)(6), 38.83(c)(6), 38.95(c)(6), 38.125(c)(6)]

**Problem:** What if a ramp is attached to a station platform instead of the vehicle, are the requirements for ramp attachment and gaps the same?

**Solution:** Ramp or bridge plates attached to and deployed from a station platform are permitted in lieu of on-vehicle devices provided the same requirements that were outlined in the previous Problem/Solution are met. [38.83(c)(6), 38.95(c)(6), 38.125(c)(6)]

☐ **Stowage**

**Problem:** After boarding the vehicle, the ramp is generally stowed away. Is there a specific design requirement for stowage of the ramp?

**Solution:** A compartment, securement system, or other appropriate method shall be provided to ensure that stowed ramps or bridge plates, including portable ramps or bridge plates stowed in the passenger area, do not impinge on a passenger's wheelchair or mobility aid or pose any hazard to passengers in the event of a sudden stop or maneuver of the vehicle. [38.23(c)(7), 38.83(c)(7), 38.95(c)(7), 38.125(c)(7)]



## Handrails

**Problem:** Many ramps do not have handrails which makes it difficult to negotiate, especially for a person who is walking up the ramp. Are handrails required on ramps, and if so, where should they be located? Should the handrails be the same size as handrails in facilities and onboard the vehicle?

**Solution:** Handrails on ramps are not required, but if they are provided, they shall allow persons with disabilities to grasp them from outside the vehicle while starting to board, and to continue to use them throughout the boarding process, and shall have the top between 30 in (760 mm) and 38 in (965 mm) above the ramp surface. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1-1/4 in (32 mm) and 1-1/2 in (38 mm) or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than 1/8 in (3 mm). Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle. [38.23(c)(8), 38.83(c)(8), 38.95(c)(8), 38.125(c)(8)]

## SECUREMENT DEVICES

Securement devices are only required in buses and vans. In vehicles in excess of 22 ft (6.7 m) in length, at least one securement device or system shall secure the wheelchair or mobility aid facing toward the front of the vehicle. Additional securement devices or systems shall secure the wheelchair or mobility aid facing forward, or rearward with a padded barrier, extending from a height of 38 in (965 mm) from the vehicle floor to a height of 56 in (1420 mm) from the vehicle floor with a width of 18 in (455 mm), laterally centered immediately in back of the seated individual. In vehicles 22 ft (6.7 m) in length or less, the required securement device may secure the wheelchair or mobility aid either facing toward the front of the vehicle or facing rearward, with a padded barrier as described. Additional securement locations shall be either forward or rearward facing with a padded barrier. Such barriers need not be solid provided equivalent protection is afforded. Commuter rail and intercity rail vehicles are required to have a space on the vehicle which will accommodate a wheelchair. The space shall have a minimum clear floor area of 48 in (1220 mm) by 30 in (760 mm), but no securement device is required on those vehicles. The specific design requirements for the securement area and securement devices for buses and vans follow.

### Checklist of Problems - Specific Design Requirements

- ☐ Design Load
- ☐ Location and Size
- ☐ Orientation
- ☐ Movement
- ☐ Stowage
- ☐ Seat Belt and Shoulder Harness

#### ☐ Design Load

**Problem:** The differences between vans and buses is quite significant. Are the specifications for securement devices for these vehicles different? It would seem like the smaller vehicle would require a stronger securement device so if an accident does occur, the person with a disability would have more protection. Also, smaller vehicles seem to move more erratically through traffic and stop and start faster than a large bus.

**Solution:** Securement devices on vehicles with GVWR's of 30,000 pounds (13,620 kg) or above, and their attachments to such vehicles, shall restrain a force in the forward longitudinal direction of up to 2,000 pounds (908 kg) per securement leg or clamping mechanism and a minimum of 4,000 pounds (1816 kg) for each mobility aid. Securement systems on vehicles with GVWR's of up to 30,000 pounds (13,620 kg), and their attachments to such vehicles, shall restrain a force in the forward longitudinal direction of up to 2,500 pounds (1135 kg) per securement leg or clamping mechanism and a minimum of 5,000 pounds (2270 kg) for each mobility aid. [38.23(d)(1)]

Note: These requirements are based on actual crash profiles for large and small vehicles. The reference to "securement leg" is not intended to imply that only a two-leg securement is specified, only that each leg which would exert force in the rearward direction have adequate strength.

## ☐ Location and Size

**Problem:** Some securement areas are located too far away from the operator and this makes it difficult to gain access to the operator when required. The securement area is often in the same area as some seats and even though the seats can be folded up, they are generally occupied and the operator must ask the people to move. Once settled in the securement area, the wheelchair overlaps the aisleway and makes it difficult for people to pass by when entering and exiting the bus.

**Solution:** The securement system shall be placed as near to the accessible entrance as practicable and shall have a clear floor area of 30 in (760 mm) by 48 in (1220 mm). Such space shall adjoin, and may overlap, an access path. Not more than 6 in (150 mm) of the required clear floor space may be accommodated for footrests under another seat provided there is a minimum of 9 in (225 mm) from the floor to the lowest part of the seat overhanging the space. Securement areas may have fold-down seats to accommodate other passengers when a wheelchair or mobility aid is not occupying the area, provided the seats, when folded up, do not obstruct the clear floor space required. The securement system shall secure common wheelchairs and mobility aids and shall either be automatic or easily attached by a person familiar with the system and mobility aid and having average dexterity. [38.23(d)(2) and (3)]

**Note:** The DOT rule requires operators to secure common wheelchairs as best they can, even if the securement device is not designed for the specific wheelchair. It is advisable that transit agencies retrofit existing vehicles with current securement systems.

## ☐ Orientation

Slide 20 **Problem:** It is very difficult to see where the next bus stop is when facing sideways away from the sidewalk side of the bus. Also, the jerky movements of the van or bus would be easier to withstand if the wheelchair could be pointed in the same direction as the front of the vehicle. Some vehicles are arranged so the wheelchair faces toward the rear. When the vehicle stops quickly, it is difficult to prepare for the stop since the view is out of the rear window and without being prepared the stopping action could cause a person's neck to be thrown backward.

**Solution:** In vehicles in excess of 22 ft (6.7 m) in length, at least one securement device or system shall secure the wheelchair or mobility aid facing toward the front of the vehicle. In vehicles 22 ft (6.7 m) in length or less, the required securement device may secure the wheelchair or mobility aid either facing toward the front of the vehicle or rearward. Additional securement devices or systems shall secure the wheelchair or mobility aid facing forward or rearward. Where the wheelchair or mobility aid is secured facing the rear of the vehicle, a padded barrier shall be provided. The padded barrier shall extend from a height of 38 in (965 mm) from the vehicle floor to a height of 56 in (1420 mm) from the vehicle floor with a width of 18 in (460 mm), laterally centered immediately in back of the seated individual. Such barriers need not be solid provided equivalent protection is afforded. [38.23(d)(4)]

## ☐ Movement

**Problem:** Some securement systems don't seem to be tight enough and when the vehicle starts or stops, the wheelchair moves quite a bit.

**Solution:** When the wheelchair or mobility aid is secured in accordance with manufacturer's instructions, the securement system shall limit the movement of an occupied wheelchair or mobility aid to no more than 2 in (50 mm) in any direction under normal vehicle operating conditions. [38.23(d)(5)]

## ☐ Stowage

**Problem:** Once in the securement area, there have been times when the securement device has been vandalized and doesn't work. Also, some securement devices seem to stick out from the wall of the vehicle and it appears they could be a hazard to people standing nearby.

**Solution:** When not being used for securement, or when the securement area can be used by standees, the securement system shall not interfere with passenger movement, shall not present any hazardous condition, shall be reasonably protected from vandalism, and shall be readily accessed when needed for use. [38.23(d)(6)]

☐ **Seat Belt and Shoulder Harness**

Slide **Problem:** Seat belts and shoulder harnesses are required in automobiles for the  
21 safety of the passengers. Are they required in vans and buses for persons secured  
in the securement area?

**Solution:** For each wheelchair or mobility aid securement device provided, a passenger seat belt and shoulder harness, complying with all applicable provisions of 49 CFR Part 571, shall also be provided for use by wheelchair or mobility aid users. Such seat belts and shoulder harnesses shall not be used in lieu of a device which secures the wheelchair or mobility aid itself. [38.23(d)(7)]

Note: This section requires seat and shoulder belts to be provided; whether they are used is not addressed.

## EXERCISES

1. What is the size of a common wheelchair?
  - (a) 27 in (685 mm) by 54 in (1370 mm)
  - (b) 30 in (760 mm) by 48 in (1220 mm)
  - (c) 48 in (1220 mm) by 48 in (1220 mm)
  - (d) 32 in (815 mm) by 48 in (1220 mm)
2. What is the design load for a platform lift?
  - (a) 750 pounds (340 kg)
  - (b) 450 pounds (204 kg)
  - (c) 500 pounds (227 kg)
  - (d) 600 pounds (272 kg)
3. How high should the barrier (curbing) along the sides of the platform be?
  - (a) 1 in (25 mm)
  - (b) 1-1/2 in (38 mm)
  - (c) 2 in (50 mm)
  - (d) 3 in (76 mm)
4. When the side barriers along the platform and the barriers at the front and back of the platform are raised, what is the maximum gap allowed?
  - (a) 1/2 in (12 mm)
  - (b) 5/8 in (16 mm)
  - (c) 1 in (25 mm)
  - (d) 1/4 in (6 mm)
5. How long must the handrails on the platform lift be to comply with the standards?
  - (a) 24 in (610 mm)
  - (b) 36 in (915 mm)
  - (c) 8 in (200 mm)
  - (d) 12 in (305 mm)
6. What is the design load for a ramp or bridge plate which is shorter than 30 in (760 mm)?
  - (a) 250 pounds (114 kg)
  - (b) 450 pounds (204 kg)
  - (c) 300 pounds (136 kg)
  - (d) 600 pounds (272 kg)



7. What is the maximum permissible change in elevation at the transition between the street or platform and the ramp?
- (a) 1 in (25 mm)
  - (b) 5/8 in (16 mm)
  - (c) 1/4 in (6 mm)
  - (d) 1/2 in (12 mm)
8. How wide must a ramp be to comply with the standards?
- (a) 36 in (915 mm)
  - (b) 27 in (685 mm)
  - (c) 30 in (760 mm)
  - (d) 32 in (815 mm)
9. What is the maximum permissible slope for a ramp between the street and the bus/van floor?
- (a) 1:20
  - (b) 1:12
  - (c) 1:8
  - (d) 1:4
10. What is the maximum permissible slope between the platform and the floor of a light rail vehicle? Note the platform is 12 in (302 mm) lower than the floor of the vehicle.
- (a) 1:20
  - (b) 1:12
  - (c) 1:8
  - (d) 1:4
11. How high must the handrails on a ramp be above the ramp surface when handrails are provided?
- (a) Between 24 in (610 mm) and 36 in (915 mm)
  - (b) Between 30 in (760 mm) and 38 in (965 mm)
  - (c) 32 in (815 mm)
  - (d) There is no specification on height.
12. On a transit bus that is longer than 22 feet, what is the minimum number of wheelchair securement devices which must be provided?
- (a) One
  - (b) Two
  - (c) Three
  - (d) Four

13. On a transit bus that is longer than 22 feet, how many forward facing wheelchair securement devices must be provided?
- (a) One
  - (b) Two
  - (c) Three
  - (d) Four
14. Can side facing securement systems be provided?
- (a) Yes
  - (b) No
15. Can all securement systems on vans (less than 22 feet) be rear facing?
- (a) Yes
16. Are securement devices required on rail vehicles?
- (a) Yes
  - (b) No



UNIT 6-1  
VEHICLE ENROUTE ACCESSIBILITY  
BUSES/VANS

**SCOPE**

The Department of Transportation rules implementing the vehicle accessibility requirements of ADA can be found at two levels of detail. The first area which addresses the more general requirements is 49 CFR Part 37, Subpart D - Acquisition of Accessible Vehicles by Public Entities and Subpart E - Acquisition of Accessible Vehicles by Private Entities. The second more specific design criteria is contained in 49 CFR Part 38, ADA Accessibility Specifications for Transportation Vehicles, Subpart B - Buses, Vans and Systems, and Subpart G - Over-the-Road Buses and Systems.

**Slide 1**

This unit addresses all of the barriers that could be encountered by individuals with disabilities including individuals who use wheelchairs and mobility aids while they are on a bus, van or paratransit vehicle. Barriers are encountered as an individual moves from the entrance vestibule to the seating area, finds the priority seating and gets settled, and, when appropriate, informs the bus operator of the desired destination. This unit does not address the barriers encountered by individuals in wheelchairs or mobility aids as they board the bus and get settled into the securement devices; that portion of the trip for individuals who use wheelchairs and mobility aids is addressed in Unit 5-4.

## **DEFINITIONS**

**Bus:** Any of several types of self-propelled vehicles, generally rubber-tired, intended for use on city streets, highways, and busways, including but not limited to mini buses, forty-and thirty-foot buses, articulated buses, double-deck buses and electrically powered trolley buses used by public entities to provide designated public transportation service and by private entities to provide transportation service, including but not limited to, specified public transportation service. Self-propelled, rubber-tired vehicles designed to look like antique or vintage trolleys are considered buses.

**Over-the-Road Bus:** A bus characterized by an elevated passenger deck located over a baggage compartment.

**New Vehicle:** A vehicle (bus) which is offered for sale or lease after manufacture without any prior use.

**Used Vehicle:** A vehicle with prior use.

**Remanufactured Bus:** A bus which has been structurally restored and has had new or rebuilt major components installed to extend its service life by 5 years or more.

**Fixed Route System:** A system of transporting individuals, including the provision of designated public transportation service by public entities and the provision of transportation service by private entities, including, but not limited to, specified public transportation service, on which a vehicle is operated along a prescribed route according to a fixed schedule.

**Demand Responsive System:** Any system of transporting individuals, including the provision of designated public transportation service by public entities and the provision of transportation service by private entities, including, but not limited to, specific transportation service which is not a fixed route system.

## APPLICABLE STANDARDS

49 CFR Part 37 Subpart D	Acquisition of Accessible Vehicles by Public Entities
49 CFR 37.71	Purchase and Lease of New Non-Rail Vehicles by Public Entities Operating Fixed Route Systems
49 CFR 37.73	Purchase and Lease of Used Non-Rail Vehicles by Public Entities Operating Fixed Route Systems
49 CFR 37.75	Remanufacture of Non-Rail Vehicles and Purchase and Lease of Remanufactured Non-Rail Vehicles by Public Entities Operating Fixed Route Systems
49 CFR 37.77	Purchase and Lease of New Non-Rail Vehicles by Public Entities Operating a Demand Responsive System for the General Public
49 CFR Part 38 Subpart B	Buses, Vans and Systems
49 CFR 38.21	General
49 CFR 38.25	Door Step Thresholds (Aisles, Floors)
49 CFR 38.27	Priority Seating Signs
49 CFR 38.29	Interior Circulation, Handrails and Stanchions
49 CFR 38.35	Public Information Systems
49 CFR 38.37	Stop Request

## PROBLEMS AND SOLUTIONS

The problems or barriers individuals with disabilities encounter once on board the bus will be addressed at two levels of detail. The first level, General Requirements, will define the buses that must be made accessible. The Specific Design Requirements, the second level of detail, address the design specifications for each element that is required for a bus to be considered accessible.

### Checklist of Problems - General Requirements

- ☐ Accessibility of New Buses
- ☐ Accessibility of Used Buses
- ☐ Accessibility of Remanufactured Buses
- ☐ Existing Inaccessible Buses
- ☐ Operation and Maintenance

### ☐ Accessibility of New Buses

**Problem:** A public entity that operates a fixed route bus system is preparing a solicitation for new buses. The solicitation will be ready for advertisement in one month. Does the solicitation have to require accessible buses?

**Solution:** Yes. Each public entity operating a fixed route system making a solicitation after October 6, 1991 to purchase or lease a new bus or other new vehicle for use on the system, shall ensure the vehicle is readily accessible to and usable by individuals with disabilities including individuals who use wheelchairs and complies with the standards in 49 CFR Part 38. [37.71(a)]

**Problem:** A public entity operating a fixed route bus system publicly advertised for the lease of several hundred buses. The advertisement specified that the buses had to be readily accessible and usable by persons with disabilities including individuals who use wheelchairs. The low bidder was selected and a contract was awarded. Several months after contract award, the lessee requested a modification to the lease agreement which would exclude the accessibility feature on fifty percent of the buses because there was no qualified manufacturer of lifts that could provide the number of lifts required. Can the public entity change the lease agreement?

**Solution:** A public entity may purchase or lease a new bus that is not readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, if it applies for, and the FTA Administrator grants, a waiver as provided in this section.

Before submitting a request for such a waiver, the public entity shall hold at least one public hearing concerning the proposed request.

The FTA Administrator may grant a request for such a waiver if the public entity demonstrates to the FTA Administrator's satisfaction that --

- o The initial solicitation for new buses made by the public entity specified that all new buses were to be lift-equipped and were to be otherwise accessible to and usable by individuals with disabilities;
- o Hydraulic, electromechanical, or other lifts for such new buses could not be provided by any qualified lift manufacturer to the manufacturer of such new buses in sufficient time to comply with the solicitation; and
- o Any further delay in purchasing new buses equipped with such necessary lifts would significantly impair transportation services in the community served by the public entity.

The public entity shall include with its waiver request a copy of the initial solicitation and written documentation from the bus manufacturer of its good faith efforts to obtain lifts in time to comply with the solicitation, and a full justification for the assertion that the delay in bus procurement needed to obtain a lift-equipped bus would significantly impair transportation services in the community. This documentation shall include a specific date at which the lifts could be supplied, copies of advertisements in trade publications and inquiries to trade associations seeking lifts, and documentation of the public hearing. [37.71(b)(c)(d)(e)]



**Problem:** A public entity has submitted a waiver request to FTA. The waiver request clearly demonstrates that all of the conditions for a waiver have been met by the public entity. What actions must FTA take in granting and properly documenting the waiver, and what conditions, if any, should be contained in the waiver?

**Solution:** Any waiver granted by the FTA Administrator under this section shall be subject to the following conditions:

- o The waiver shall apply only to the particular bus delivery to which the waiver request pertains;
- o The waiver shall include a termination date, which will be based on information concerning when lifts will become available for installation on the new buses the public entity is purchasing. Buses delivered after this date, even though procured under a solicitation to which the waiver applied, shall be equipped with lifts;
- o Any bus obtained subject to the waiver shall be capable of accepting a lift, and the public entity shall install a lift as soon as one becomes available;
- o Such other terms and conditions as the FTA Administrator may impose.

When the FTA Administrator grants a waiver under this section, he/she shall promptly notify the appropriate committee of Congress. If the FTA Administrator has reasonable cause to believe that a public entity fraudulently applied for a waiver under this section, the FTA Administrator shall:

- o Cancel the waiver if it is still in effect; and
- o Take other appropriate action. [37.71(f)(g)]

**Problem:** A public entity operating a demand responsive system is preparing a solicitation for new vehicles. The solicitation will be ready for advertisement in one month. Does the solicitation have to require accessible vehicles?

**Solution:** A public entity operating a demand responsive system for the general public, making a solicitation after October 6, 1991, to purchase or lease a new bus or other new vehicle for use on the system shall ensure that the vehicle complies with Part 38, EXCEPT if the system, when viewed in its entirety, provides a level of service to individuals with disabilities including individuals who use wheelchairs, equivalent to the level of service it provides to individuals without disabilities, then the public entity may purchase new vehicles that are not readily accessible. [37.77(a)(b)]

**Note:** For each new vehicle purchased, ask the question, "Do I have enough accessible vehicles?" If the answer is no, the vehicle must meet Part 38 standards; if yes, it does not.

**Problem:** How is equivalent level of service between individuals with disabilities including individuals who use wheelchairs and individuals who are not disabled determined and documented?

**Solution:** A demand responsive system, when viewed in its entirety, shall be deemed to provide equivalent service if the service available to individuals with disabilities, including individuals who use wheelchairs, is provided in the most integrated setting appropriate to the needs of the individual and is equivalent to the service provided other individuals with respect to the following service characteristics:

- (1) Response time;
- (2) Fares;
- (3) Geographic area of service;
- (4) Hours and days of service;
- (5) Restrictions or priorities based on trip purpose;
- (6) Availability of information and reservations capability; and
- (7) Any constraints on capacity or service availability.

Before procuring an inaccessible vehicle, public entities must file a certificate showing that equivalent service is provided to individuals with disabilities and other persons. The certificate should be filed as follows: [37.77(c)(d)]

Public Entity:	File Certificate:
Receiving FTA Section 18 Funds	With Appropriate State Program Office
Receiving FTA Section 9 Funds from a State Administering Agency	With Appropriate State Program Office
Receiving Any Other FTA Funds and Operating Demand Responsive Service	With Appropriate FTA Regional Office
Receiving NO FTA Funds	In Public Entity Files for Inspection by FTA

**Problem:** Can a waiver from the FTA be granted for vehicles operating on a demand responsive system similar to vehicles operating on a fixed route system?

**Solution:** Yes. The waiver procedures and documentation/approval process is the same for a vehicle operating on a demand responsive system as it is for a vehicle operating on a fixed route system. [37.79]

#### ☐ Accessibility of Used Buses

**Problem:** A public entity is preparing a solicitation to purchase used buses which can be operated on its fixed route system. The solicitation will be ready for advertisement in approximately two months. Does the solicitation have to require accessible buses?

**Solution:** Each public entity operating a fixed route system purchasing or leasing, after October 6, 1991, a used bus or other vehicle for use on the system, shall ensure that the vehicle complies with Part 38 standards.

A public entity may purchase or lease a used vehicle for use on its fixed route system that is not readily accessible to and usable by individuals with disabilities if, after making demonstrated good faith efforts to obtain an accessible vehicle, it is unable to do so. [37.73(a)(b)]

**Problem:** What constitutes good faith efforts to obtain an accessible used vehicle?

**Solution:** Good faith efforts shall include at least the following steps:

- (1) An initial solicitation for used vehicles specifying that all used vehicles are to be lift-equipped and otherwise accessible to and usable by individuals with disabilities, or, if an initial solicitation is not used, a documented communication so stating;
- (2) A nationwide search for accessible vehicles, involving specific inquiries to used vehicle dealers and other transit providers; and
- (3) Advertising in trade publications and contacting trade associations.

Each public entity purchasing or leasing used vehicles that are not readily accessible to and usable by individuals with disabilities shall retain documentation of the specific good faith efforts it made for three years from the date the vehicles were purchased. These records shall be made available, on request, to the FTA Administrator and the public. [37.73(c)(d)]

**Problem:** A transit authority operates a large bus fleet on a fixed route system. The fleet is aging. A plan has been developed to extend the useful life of the fleet by purchasing several hundred remanufactured buses and to set up a rebuild process at the largest garage on the property so the transit authority can remanufacture its own buses. Most of the buses scheduled to be remanufactured on property are not accessible. Do the remanufactured buses that are to be purchased have to be accessible? Do the buses that are to be remanufactured by the transit authority have to be made accessible?

**Solution:** If a public entity purchases or leases a remanufactured bus or remanufactures a bus after August 25, 1990, and the useful life of the bus is extended by 5 years due to the remanufacture process, then the remanufactured buses must, to the maximum extent feasible, be readily accessible and usable by individuals with disabilities, including individuals who use wheelchairs. Also, if the agency remanufactures buses to extend their life 5 years or more, they must meet Part 38 to the maximum extent possible. [37.75(a)(b)]

**Note:** The requirement does not apply to an overhaul that is not designed to extend the life beyond its normal useful life.

**Problem:** What is the definition of maximum extent feasible as used in the previous problem:

**Solution:** It shall be considered feasible to remanufacture a bus or other motor vehicle so as to be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless an engineering analysis demonstrates that including accessibility features required by this part would have a significantly adverse effect on the structural integrity of the vehicle. [37.75(c)]

☐ **Existing Inaccessible Buses**

**Problem:** Almost fifty percent of the bus fleet in a large metropolitan area is not equipped with lifts, ramps or other boarding devices. Does the ADA require that all of these existing inaccessible buses be retrofitted with lifts or ramps?

**Solution:** The ADA Accessibility Guidelines for Vehicles does not require that inaccessible buses be retrofitted with lifts, ramps or other boarding devices. [38.21(b)]

**Problem:** The agency is planning to refurbish the interior of some buses. Do they need to be made accessible?

**Solution:** If elements covered by Part 38 are altered, they must meet the new standards to the maximum extent feasible. If handrails are modified or replaced, they must meet the handrail requirements; if flooring is replaced, it must be slip resistant. If the lift is replaced, the new lift must meet the new standards, to the extent feasible.

**Note:** If the door isn't wide enough to accommodate a Part 38 lift, the widest lift feasible would be installed.

☐ **Operation and Maintenance**

**Problem:** The local public bus system is equipped with on-board public address (PA) systems. At one time, the drivers were supposed to announce each stop over the PA system. I have never heard a driver use the system. One operator told me that it was not required under the union contract.

**Solution:** The DOT Rule requires that the entity (public and private) use the equipment it has. The operator is required to use the PA system to announce stops unless he can be heard throughout the bus without the PA system. On fixed route systems, the entity shall announce stops as follows:

(1) The entity shall announce at least at transfer points with other fixed routes, other major intersections and destination points, and intervals along a route sufficient to permit individuals with visual impairments or other disabilities to be oriented to their location.

(2) The entity shall announce any stop on request of an individual with a disability. [37.167]

Problems and solutions related to specific design requirements address those barriers that disabled persons encounter from the time when they have boarded the bus and the bus doors have closed (for disabled persons in wheelchairs after they are secured in a securement location) until they have located and requested the bus to stop at their intended destination. If portions of the vehicle are modified in any way that affects or could affect accessibility, each such portion shall comply with the specific design requirements.

#### Checklist of Problems - Specific Design Requirements

- ☐ Interior Circulation, Handrails and Stanchions
- ☐ Floors, Aisles
- ☐ Priority Seating Signs
- ☐ Public Information Systems
- ☐ Stop Request

## ☐ Interior Circulation, Handrails and Stanchions

**Problem:** Placement of stanchions and handrails around the vestibule area of the bus, in the doorway/stepwell area and along the aisles sometimes causes those spaces to be very difficult to negotiate in a wheelchair. Are there any specific guidelines in the DOT Rule which set the requirements for clear widths and clear floor space?

Slide 2 **Solution:** On transit buses, interior handrails and stanchions shall permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a securement location from the lift or ramp. Securement area clear floor space dimensions are specified in the DOT Rule. The DOT vehicle specifications do not specifically prescribe the minimum dimensions for the vestibule or aisles. Even though there are no specific requirements, ADAAG should be used as follows:

- Door width: Clear door width is generally required to be 32 in (815 mm) minimum. Door width is not specified for buses because it will generally be controlled by the minimum lift width.
- Vestibule area: ADAAG 4.2 Space Allowance and Reach Ranges - The space required for a wheelchair to make a 180 degree turn is a clear space of 60 in (1525 mm) in diameter or an L-shaped space with 36 in (915 mm) aisleways.
- Aisle widths: ADAAG 4.2 Space Allowance and Reach Ranges - The minimum clear width for single wheelchair passage shall be 32 in (815 mm) at a point and 36 in (915 mm) continuously.
- Securement area: The minimum clear floor area required to accommodate a single stationary wheelchair and occupant is 30 in (760 mm) by 48 in (1220 mm). [38.23(d)(2)]



**Problem:** When paying the fare, there is nothing stable to lean against or hold onto as you pay. Sometimes, the driver starts moving the bus while people are still paying the fare and they must hold onto the stanchions across the aisle from the fare box. A person with a walking disability finds that difficult.

Slide 3 **Solution:** On transit buses longer than 22 ft (6.7 m) and on over-the-road buses where on-board fare collection devices are used, a horizontal passenger assist (handrail, grab bar or other appropriate surface) shall be located across the front of the vehicle between boarding passengers and the fare collection device to prevent passengers from sustaining injuries on the fare collection device or the bus windshield in the event of a sudden deceleration. This horizontal passenger assist must not restrict the vestibule space and must provide support for the boarding passenger from the doorway through the boarding process. The passenger assist shall be secured and designed such that passengers are able to lean against the assist for security while paying fares. [38.29(b), 38.155(a)]

**Problem:** Once on board the bus, often times the driver starts to move before everyone is seated. Sometimes it is difficult to negotiate the aisleway without anything to hold on to.

Slide 4 **Solution:** For vehicles in excess of 22 ft (6.7 m) in length, overhead handrail(s) shall be provided which shall be continuous except for a gap at the rear doorway. [38.29(c)]

**Problem:** In the areas of the bus where the seats are facing sideways, it is difficult to stand while the bus is moving. There doesn't seem to be enough handrails or vertical stanchions to hold onto so one can move around the bus safely.

Slide 5 **Solution:** Handrails and stanchions shall be sufficient to permit safe boarding, on board circulation, seating and standing assistance, and alighting by persons with disabilities. [38.29(d)]

**Problem:** Some of the handrails are so close to the surface they are attached to that it is difficult to get your fingers between the handrail and the adjacent surface. Is there a specific offset that is required when mounting handrails?

Slide 6 **Solution:** Handrails used on transit buses and over-the-road buses shall have a grab bar with a cross-sectional diameter between 1-1/4 in (32 mm) and 1-1/2 in (38 mm) or shall provide an equivalent grasping surface. Edges on the handrail shall be rounded and have a minimum radius of 1/8 in (3.2 mm). All handrails shall be placed and mounted so there is a minimum 1-1/2 in (38 mm) space between the grasping surface and the adjacent surface. [38.29(b), 38.155(a)]

**Problem:** Once the wheelchair lift has raised the wheelchair to the same level as the bus aisle floor, the individual in the wheelchair must negotiate through the fare box/driver vestibule area to the securement area. The placement of the vertical stanchion is critical because the foot rest of the wheelchair can hit the stanchion as the turning movement is made if there is not enough clear floor space to maneuver the wheelchair around the corner.

Slide 7 **Solution:** For vehicles in excess of 22 ft (6.7 m) in length with front-door lifts or ramps, vertical stanchions immediately behind the driver shall either terminate at the lower edge of the aisle-facing seats, if applicable, or be "dog-legged" so that the floor attachment does not impede or interfere with wheelchair footrests. If the driver seat platform must be passed by a wheelchair or mobility aid user entering the vehicle, the platform, to the maximum extent practicable, shall not extend into the aisle or vestibule beyond the wheel housing. [38.29(e)]

**Problem:** When the individual in the wheelchair moves between the lift platform, through the vestibule area and down the aisle and into the securement area, it is important that there are no overhead objects that could obstruct this path of travel. How much distance should there be between the floor and the overhead handrails to ensure that individuals in wheelchairs have sufficient headroom to move from the ramp platform to the securement area?

Slide 8 **Solution:** For vehicles in excess of 22 ft (6.7 m) in length, the minimum interior height along the path from the lift to the securement location shall be 68 in (1730 mm). For vehicles of 22 ft (6.7 m) in length or less, the minimum interior height from lift to securement location shall be 56 in (1420 mm). [38.29(f)]

☐ **Floors and Aisles**

**Problem:** When it is raining or snowing the aisleways in the bus get wet from all the traffic moving in and out of the bus. Some floor surfaces are quite slippery when they get wet, making it difficult for individuals with disabilities to negotiate the aisleway especially when the bus is moving.

**Solution:** All aisles and floor areas where people walk and floors in securement locations shall have a slip-resistant surface. [38.25(a)]

**Problem:** In developing a specification for a new bus procurement, what standard should be used to ensure that the floor area and steps are provided with the mandated "slip resistant" surface?

Slide 9 **Solution:** There is not specific requirement, but an appendix recommends the coefficient of friction as the appropriate descriptor to measure slip resistance. The coefficient of friction is the ratio between the force necessary to move one surface over another surface and the pressure between the two surfaces. For example, the coefficient of friction for cast iron on oak is 38:100 or 0.38. A research project conducted with persons with disabilities concluded that a static coefficient of friction of 0.6 was appropriate for steps, floors and lift platforms and a coefficient of friction of 0.8 was desirable for ramps.

## ☐ Priority Seating Signs

**Problem:** Once on the bus, it is difficult to tell where the priority seating is located. The priority seating signs are often missing and on some buses they have never been installed. Generally, the priority seats are located in the front of the bus facing sideways. It is difficult to sit sideways on the bus especially when the bus is stopping and starting in heavy traffic.

Slide 10 **Solution:** Each vehicle shall contain sign(s) which indicate that seats in the front of the vehicle are priority seats for persons with disabilities, and that other passengers should make such seats available to those who wish to use them. At least one set of forward-facing seats shall be so designated. Each securement location shall have a sign designating it as such.

Note: Forward facing seats are not required where all seats are aisle-facing.

**Problem:** Many of the priority seating signs are so small that people with vision impairments cannot read them. Also, on some of the buses, the background of the priority seat sign is almost the same color as the lettering which makes it difficult to see and read.

**Solution:** Characters on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case "X") of 5/8 in (16 mm) with "wide" spacing (generally, the space between letters shall be 1/16 the height of upper case letters), and shall contrast with the background either light-on-dark or dark-on-light. [38.75]

Raised or Braille characters or pictorial symbol signs, are not required, but could be used to make it easier for persons with low vision or persons who are blind to tell where the priority seating is located. If a pictorial symbol is used, the international symbol of accessibility should be used. The border dimensions of the pictorial shall be 6 in (152 mm) minimum in height. If raised letters are used they shall be raised 1/32 in (0.8 mm), upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille. The raised characters shall be at least 5/8 in (16 mm) high but no higher than 2 in (50 mm). [4.30.4]

## ☐ Public Information Systems

**Problem:** It is difficult for persons with vision impairments to tell when the bus is approaching their stop. Since the bus does not automatically stop at all bus stops and a stop request signal must be used, it would be good if the bus driver could announce each stop, or at a minimum, announce when the bus approaches major intersections along the route.

**Solution:** Vehicles in excess of 22 ft (6.7 m) in length, used in multiple-stop, fixed route service, shall be equipped with a public address system permitting the driver, or recorded and digitized human speech messages, to announce stops and provide other passenger information within the vehicle. [38.27(a)] In addition, the DOT rule requires drivers to announce certain stops. [37.167(b)]

Note: Some systems have external P.A. systems and some electronic head signs announce route designation whenever the door opens

## ☐ Bus Stop Request

**Problem:** Individuals secured on the bus at the securement area generally tell the bus operator where they are going and where they would like to stop and get off the bus. Sometimes the bus driver forgets and overruns the stop which makes it very inconvenient for a person in a wheelchair.

**Solution:** Where passengers may board or alight at multiple stops at their option, vehicles in excess of 22 ft (6.7 m) in length shall provide controls adjacent to the securement location for requesting stops and which alert the driver that a mobility aid user wishes to disembark. Such a system shall provide auditory and visual indications that the request has been made. [38.37(a)]

Slides 11,12

**Problem:** The stop request mechanism located on the wall of the bus near the wheelchair securement area is out of reach for some individuals who use the securement area. What are the design requirements to accommodate the reach limitations for persons who are in wheelchairs or mobility aids?

**Solution:** Controls for the stop request in the securement area shall be mounted no higher than 48 in (1220 mm) and no lower than 15 in (380 mm) above the floor shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N). [38.37(b)]

## EXERCISES

1. On transit buses that are longer than 22 feet where onboard fare collection is used, what are the requirements for handrails around the fare collection area?
  - (a) A horizontal handrail should be placed around the fare box.
  - (b) A vertical stanchion should be placed on each corner of the fare box.
  - (c) A horizontal handrail should be located across the front of the vehicle between boarding passengers and the fare box.
2. On transit buses that are longer than 22 feet, where should the overhead handrails be located?
  - (a) One small handrail should be placed above each seat.
  - (b) Continuous handrails should be placed along the total length of the bus over each side of the aisle.
  - (c) Continuous handrail(s) should be placed along the length of the bus except for a gap at the rear doorway.
3. How far away from the wall should the handrail be placed so people can grab the handrail easily?
  - (a) 1 in (25 mm)
  - (b) 1-1/4 in (32 mm)
  - (c) 1-1/2 in (38 mm)
  - (d) 2 in (50 mm)
4. On a transit bus that is longer than 22 feet, what is the minimum acceptable clear height for handrails along the path from the platform lift to the securement areas?
  - (a) 56 in (1420 mm)
  - (b) 60 in (1520 mm)
  - (c) 68 in (1730 mm)
  - (d) 72 in (1830 mm)
5. All of the seats on a bus face toward the aisle. How many seats should be designated as priority seating?
  - (a) one set
  - (b) two sets
  - (c) one set on each side of the aisle

6. Is a public address system required on a transit bus that is longer than 22 feet?
- (a) Yes
  - (b) No
7. What is the range above the floor of a bus where the stop request control can be located?
- (a) 15 in (380 mm) to 48 in (1220 mm)
  - (b) 9 in (230 mm) to 54 in (1370 mm)
  - (c) 9 in (230 mm) to 36 in (915 mm)
  - (d) 6 in (150 mm) to 24 in (610 mm)

UNIT 6-2  
VEHICLE ENROUTE ACCESSIBILITY  
RAPID RAIL VEHICLES

**SCOPE**

The Department of Transportation rules implementing the vehicle accessibility requirements of ADA can be found at two levels of detail. The first area which addresses the more general requirements is 49 CFR Part 37, Subpart D - Acquisition of Accessible Vehicles by Public Entities and Subpart E - Acquisition of Accessible Vehicles by Private Entities. The second more specific design criteria is contained in 49 CFR Part 38, ADA Accessibility Specifications for Transportation Vehicles, Subpart C - Rapid Rail Vehicles and Systems.

**Slide 1**

This unit addresses all of the barriers that could be encountered by individuals with disabilities, including individuals who use wheelchairs and mobility aids once they are on board the rapid rail vehicle. Barriers are encountered as the individual moves from the entrance vestibule to the seating area, finds the priority seating and gets settled, moves between vehicles, gathers information during the trip and locates the desired destination.



## **DEFINITIONS**

**Rapid Rail:** A subway-type transit vehicle railway operated on exclusive private rights of way with high level boarding platform stations. Rapid rail may also operate on elevated and at grade level track separated from other traffic.

**New Rapid Rail Vehicle:** A rapid rail vehicle which is offered for sale or lease after manufacture without any prior use.

**Used Rapid Rail Vehicle:** A rapid rail vehicle with prior use.

**Remanufactured Rapid Rail Vehicle:** A rapid rail vehicle which has been structurally restored and has had new or rebuilt major components installed to extend its service life by 5 years.

**Retrofitted Vehicle:** A vehicle that has been modified to the extent necessary to comply with the specific accessibility standards required by the One Car Per Train Rule.

## APPLICABLE STANDARDS

49 CFR Part 37 Subpart D	Acquisition of Accessible Vehicles by Public Entities
49 CFR 37.79	Purchase and Lease of New Rail Vehicles by Public Entities Operating Rapid or Light Rail Systems
49 CFR 37.81	Purchase and Lease of Used Rail Vehicles by Public Entities Operating Rapid or Light Rail Systems
49 CFR 37.83	Purchase and Lease of Remanufactured Rail Vehicles by Public Entities Operating Rapid or Light Rail Systems
49 CFR 37.93	One Car Per Train Rule
49 CFR Part 38 Subpart C	Rapid Rail Vehicles and Systems
49 CFR 38.51	General
49 CFR 38.53	Doorways
49 CFR 38.55	Priority Seating Signs
49 CFR 38.57	Interior Circulation, Handrails and Stanchions
49 CFR 38.59	Floor Surfaces
49 CFR 38.61	Public Information Systems
49 CFR 38.63	Between Car Barriers
10.3.1(5)	ADAAG Fixed Facilities and Stations, New Construction
10.3.2(2)	ADAAG Fixed Facilities and Stations, Existing Facilities, Key Stations

## PROBLEMS AND SOLUTIONS

The problems or barriers individuals with disabilities encounter once on board a rapid rail vehicle will be addressed at two levels of detail. The first level of detail, General Requirements, address which rapid rail cars must be made accessible. To be considered accessible, new, used, and remanufactured rapid rail vehicles must comply with specific design requirements. The Specific Design Requirements, the second level of detail, address the design specifications for each element that is required for a rapid rail vehicle to be considered accessible.

### Checklist of Problems - General Requirements

- ☐ Accessibility of New Rapid Rail Vehicles
- ☐ Accessibility of Used Rapid Rail Vehicles
- ☐ Accessibility of Remanufactured Rapid Rail Vehicles
- ☐ One Car Per Train Rule

#### ☐ Accessibility of New Rapid Rail Vehicles

**Problem:** A public transit authority is preparing a specification to purchase new rapid rail vehicles. The solicitation is scheduled to be advertised publicly two months from now. Do the ADA Vehicle Specifications apply to this specification?

**Solution:** Yes, each public entity operating a rapid rail system making a solicitation after October 6, 1991 to purchase or lease a new rapid rail vehicle for use on the system shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities including individuals who use wheelchairs. [37.79] A vehicle is considered accessible if it complies with Part 38 standards.

#### ☐ Accessibility of Used Rapid Rail Vehicles

**Problem:** A public transit authority is negotiating with another transit authority to purchase some used rapid rail vehicles. Negotiations started two weeks ago and should be concluded by the end of next month. Will the purchasing authority have to make the used vehicles comply with the ADA Vehicle Standards?

**Solution:** Each public entity operating a rapid rail system that purchases or leases a used rapid rail vehicle after October 6, 1991 for use on its system shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities including individuals who use wheelchairs and complies with Part 38.

A public entity may purchase and lease a used rapid rail vehicle that is not readily accessible if after making demonstrated good faith efforts to obtain an accessible vehicle it is unable to do so.

Note: The one-car-per-train rule requires each public entity providing rapid rail service to ensure that each train consisting of two or more vehicles, includes at least one car that is accessible as soon as practicable, but in no case later than July 25, 1995. Thus, care should be taken to ensure that this requirement can be met over the entire fleet. [37.93(c)] [38.51(c)]

**Problem:** What are the good faith efforts that must be made when trying to purchase a readily accessible used rapid rail vehicle? How does the public entity document the good faith efforts?

**Solution:** Good faith efforts shall include at least the following steps:

- (1) The initial solicitation for the used vehicles published by the public entity must specify that all used vehicles were to be accessible to and usable by individuals with disabilities, or, if a solicitation is not used, a documented communication so stating;
- (2) A nationwide search for accessible vehicles, involving specific inquiries to manufacturers and other transit providers; and
- (3) Advertising in trade publications and contacting trade associations.

Each public entity purchasing or leasing used rapid rail vehicles that are not readily accessible to and usable by individuals with disabilities shall retain documentation of the specific good faith efforts it made for three years from the date the vehicles were purchased. These records shall be made available, on request, to the FTA Administrator and the public.

## ☐ Accessibility of Remanufactured Rapid Rail Vehicles

**Problem:** A transit authority plans to remanufacture some of its rapid rail vehicles and purchase some remanufactured vehicles. Do the rapid rail vehicles have to meet the vehicle accessibility specifications?

**Solution:** Yes, if a rapid rail vehicle is remanufactured so as to extend its useful life for five years or more, it shall, to the maximum extent feasible be readily accessible to and usable to individuals with disabilities, including individuals who use wheelchairs. An entity shall not purchase or lease a remanufactured vehicle which does not comply with Part 38 to the maximum extent feasible. [37.83(b)]

It shall be considered feasible to remanufacture a rapid or light rail vehicle so as to be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless an engineering analysis demonstrates that doing so would have a significant adverse effect on the structural integrity of the vehicle. [37.83(c)]

**Problem:** One of the rapid rail lines on a particular system is included on the National Register of Historic Places. The vehicles operated on the lines are considered historic. The vehicles are scheduled to be remanufactured so that the service life can be extended for another seven years. Do these "historic vehicles" have to be made accessible?

**Solution:** If a public entity operates a rapid rail system any segment of which is included on the National Register of Historic Places and if making a rapid rail vehicle of historic character used solely on such segment readily accessible to and usable by individuals with disabilities would significantly alter the historic character of such vehicles, the public entity need only make (or purchase or lease a remanufactured vehicle with) those modifications that do not alter the historic character of such vehicles. [37.83(d)]

A public entity operating a fixed route system as described above may apply in writing to the FTA Administrator for a determination of the historic character of the vehicle. The FTA Administrator shall refer such requests to the National Register of Historic Places and shall rely on its advice in making a determination of the historic character of the vehicle. [37.83(e)]

#### ☐ **One-Car-Per-Train Rule**

**Problem:** What is the One-Car-Per-Train Rule and what are the dates for implementation?

**Solution:** Each public entity providing rapid rail service shall ensure that each train, consisting of two or more vehicles, includes at least one car that is readily accessible as soon as practicable but in no case later than July 25, 1995.

Existing vehicles which are retrofitted to comply with the "one-car-per-train rule" shall have priority seating signs [38.55], adequate handrails and at least two areas for wheelchair or mobility aid users [38.57(b)], and slip resistant floors [38.59]. At new key stations, at least one door with proper signage [38.53(b)], 32 in (810 mm) wide [38.53(a)(1)], and a horizontal gap no bigger than 4 in (100 mm) and vertical displacement no more than 2 in (50 mm). Removal of seats is not required. Vehicles previously designed and manufactured in accordance with the accessibility requirements of 49 CFR 609 or the Secretary of Transportation regulations implementing section 504 of the Rehabilitation Act of 1973 that were in effect before October 7, 1991, and which can be entered and used from stations in which they are to be operated, may be used to satisfy the requirements of the one-car-per-train rule.

**Note:** If there are vehicles in your fleet which were deemed accessible under previous (504) rules, and they can be entered and used in the stations in which you now plan to operate them, they can be used to satisfy the one-car-per-train rule.

Problems and solutions related to specific design requirements address those barriers that disabled persons and persons in wheelchairs encounter from the time when they have boarded the vehicle and the doors have closed until they reach their intended station stop. These barriers are encountered as they move within the vehicle to get settled for the trip, as they move between vehicles and as they approach the various stops along their route. If portions of the vehicle are modified in such a way that it affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the specific design requirements.

#### Checklist of Problems - Specific Design Requirements

- ☐ Interior Circulation, Handrails and Stanchions
- ☐ Floors
- ☐ Priority Seating
- ☐ Doorways Connecting Vehicles
- ☐ Public Information Systems
- ☐ Platform Signage

#### ☐ Interior Circulation, Handrails and Stanchions

**Problem:** Once on the vehicle, it is difficult to move about within the vehicle/car when it is moving, accelerating or decelerating.

**Solution:** Handrails and stanchions shall be provided to assist safe boarding, on board circulation, seating and standing assistance and alighting by persons with disabilities. [38.57]

Slide 2 **Problem:** The area immediately inside of the doors is always crowded with people which makes it very difficult to maneuver a wheelchair through the area to a place where there is enough room to get settled out of the way of other passengers. On many vehicles, the vertical stanchions between the floor and ceiling are arranged and laid out so that you have to approach them from a specific angle with the wheelchair to be able to pass between them. Also, on some vehicles the seats nearest to the entryway take up space that could be used to position a wheelchair out of the way from other passengers.

**Solution:** Handrails, stanchions and seats shall allow a route at least 32 in (815 mm) wide so that at least two wheelchair or mobility aid users can enter the vehicle and position the wheelchairs or mobility aids in areas, each having a minimum clear space of 48 in (1220 mm) by 30 in (765 mm) which do not unduly restrict movement of other passengers. Space to accommodate wheelchairs and mobility aids may be provided within the normal area used by standees and designation of specific spaces is not required. Particular attention shall be given to ensuring maximum maneuverability immediately inside doors. Ample vertical stanchions from ceiling to seatback rails shall be provided. Vertical stanchions from ceiling to floor shall not interfere with wheelchair or mobility aid user circulation and shall be kept to a minimum in the vicinity of doors. [38.57]

**Problem:** Some of the handrails are difficult to grasp. Some have very sharp edges which seem to be dangerous if a person was to fall on them.

Slide 3 **Solution:** Handrails shall have a cross-sectional diameter between 1-1/4 in (32 mm) and 1-1/2 in (38 mm) or shall provide an equivalent grasping surface and have eased edges with corner radii of not less than 1/8 in (3 mm). Handrails shall be placed to provide a minimum 1-1/2 in (38 mm) knuckle clearance from the nearest adjacent surface. [38.57]

## ☐ Floors

**Problem:** Some floors become quite slippery when they are wet. Others are so smooth that even when they are dry, they are slippery. Are there standards which must be followed on rail vehicles which prescribe what type of material should be used on the floors?

**Solution:** Floor surfaces on aisles, places for standees, and areas where wheelchairs and mobility aid users are to be accommodated are to be slip resistant on all rapid rail vehicles. [38.59]

**Problem:** In developing a specification for a new rail car procurement, what standard should be used to ensure that the floor area is provided with the mandated "slip resistant" surface?

**Solution:** There is no specific requirement, but an appendix note recommends the coefficient of friction as the appropriate descriptor to measure slip resistance. The coefficient of friction is the ratio between the force necessary to move one surface over another surface and the pressure between the two surfaces. For example, the coefficient of friction for cast iron on oak is 38:100 or 0.38. A research project conducted with persons with disabilities concluded that a static coefficient of friction of 0.6 was appropriate for steps, floors and lift platforms and a coefficient of friction of 0.8 was desirable for ramps.

**Problem:** The design of the new rail vehicles calls for carpet on the floor. People who use wheelchairs and mobility aids could have a problem with a carpeted floor especially if the pile of the carpet is very thick. Are there standards that prohibit carpet?

Slide  
4

**Solution:** The ADA Accessibility Specifications for Transportation Vehicles does not address carpeted floors. A guideline that could be used is Section 4.5.3 of the ADA Accessibility Guidelines for Buildings and Facilities which states: If a carpet or carpet tile is used on a ground or floor surface, then it shall be securely attached; have a firm cushion, pad, or backing or no cushion or pad; and have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum pile thickness shall be 1/2 in (13 mm). Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim up to 1/4 in (6 mm) high can be vertical. If the edge trim is between 1/4 in (6 mm) and 1/2 in (13 mm) a bevel with a slope no greater than 1:2 shall be used.

Note: Some carpet can be slippery when wet, so specify with care.



## ☐ **Priority Seating**

**Problem:** Once on the rapid rail vehicle, it is difficult to tell where the priority seating is located. The priority seating signs are often missing and on some vehicles/cars they have never been installed.

**Solution:** Each rapid rail vehicle shall contain sign(s) which indicate that certain seats are priority seats for persons with disabilities and that other passengers should make such seats available to those who wish to use them. [38.55(a)]

Slide 5 **Problem:** Many of the priority seating signs are so small that people with vision impairments cannot read them. Also, on some vehicles, the priority seating sign background is the same color as the wall it is mounted on which makes it difficult to see.

**Solution:** Characters on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case "X") of 5/8 in (16 mm) with "wide" spacing (generally, the space between letters shall be 1/16 the height of upper case letters), and shall contrast with the background either light-on-dark or dark-on-light. [38.55(b)]

Raised or Braille characters or pictorial symbol signs, are not required, but could be used to make it easier for persons with low vision or persons who are blind to tell where the priority seating is located. If a pictorial symbol is used, the international symbol of accessibility should be used. The border dimension of the pictorial shall be 6 in (152 mm) minimum in height. If raised letters are used they shall be raised 1/32 in (0.8 mm), upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille. The raised characters shall be at least 5/8 in (16 mm) high but no higher than 2 in (50 mm). [4.30.4]

## ☐ **Doorways Connecting Vehicles**

**Problem:** If there is an emergency situation in one of the vehicles of a multi-car train, even though the aisle widths are wide enough for a wheelchair or a mobility aid to negotiate, once the person in the wheelchair reaches the door at the end of the car it is too narrow to allow passage.

Slide 6 **Solution:** If doorways connecting adjoining cars in a multi-car train are provided, and if such doorway is connected by an aisle with a minimum clear width of 30 in (765 mm) to one or more spaces where wheelchair or mobility aid users can be accommodated, then such doorway shall have a minimum clear opening of 30 in (765 mm) to permit wheelchair and mobility aid users to be evacuated to an adjoining vehicle in an emergency. [38.53(a)(2)] This provision applies only to new vehicles.

## ☐ Public Information Systems

**Problem:** When on the rapid rail vehicle it is difficult for persons with disabilities to tell when they should start getting ready to exit the train. Also, even though many of the vehicles have internal speakers, these speakers cannot be heard by persons with hearing impairments.

Slide 7 **Solution:** Each vehicle shall be equipped with an interior public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted. Each vehicle operating in stations having more than one line or route shall have an external public address system to permit transportation personnel, or recorded or digitized human speech messages, to announce train, route or line identification information. [38.61]

If station announcement systems provide information on arriving trains, an external train speaker is not required. [38.61]

**Note:** Some systems are experimenting with visual displays on vehicles. These systems help everyone.

## ☐ Platform Signage

**Problem:** When the train pulls into a station, it is difficult to see what station it is in because the station identification signs are too high. The only way to see them is to squat down and look up and out of the windows. In some stations the station identification signs are placed so far apart that you cannot see them from some of the vehicles.

Slide 8 **Solution:** New stations built after January 25, 1992, and key stations on rapid rail systems shall have identification signs complying with requirements for character proportion and height, finish and contrast of ADAAG for Buildings and Facilities. Signs shall be placed at frequent intervals and shall be clearly visible from within the vehicle on both sides when not obstructed by another train. When station identification signs are placed close to vehicle windows (i.e., on the side opposite from boarding), each shall have the top of the highest letter or symbol below the top of the vehicle window and the bottom of the lowest letter or symbol above the horizontal mid-line of the vehicle window. [10.3.1(5), 10.3.2(2)]

Station identification signs shall be designed to comply with the following signage standards.

**Character Proportion:** Letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10.

**Character Height:** Characters and numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case X. Lower case characters are permitted. If the sign is mounted over the circulation route, 80 in (2030 mm) above the floor, complying with minimum headroom, the minimum character height shall be 3 in (75 mm).

**Finish and Contrast:** The characters and background of signs shall be eggshell, matte, or other non-glare finish. Characters and symbols shall contrast with their background - either light characters on a dark background or dark characters on a light background. [10.3.1(5), 10.3.2(2), 4.30.1, 4.30.2, 4.30.3, 4.30.5]

## EXERCISES

1. If a rapid rail vehicle is retrofitted to comply with the one car per train rule, the following elements must be brought into compliance with the ADA standards:
  - o Priority seating signs [38.55]
  - o Placement of stanchions and seats to allow a 32 in (815 mm) wide route so that two wheelchairs can center and be positioned in areas each having a minimum clear space of 48 in (1220 mm) by 30 in (716 mm) [38.57(b)]
  - o Floor surface shall be slip resistant [38.59]
  - o Passenger doorways shall have a 32 in (815 mm) clear width [38.53(a)(1)]
  - o The International Symbol of Accessibility shall be displayed on the exterior of the accessible car [38.53(b)]
  - o Horizontal gap shall be no more than 4 in (100 mm) [38.53(d)]
  - o Vertical difference between platform and car floor should be plus or minus 2 in (50 mm) under 50 percent passenger load [38.53(d)]
  - (a) True
  - (b) False
2. How wide should the doorways connecting new vehicles be?
  - (a) 32 in (815 mm)
  - (b) 30 in (716 mm)
  - (c) 24 in (610 mm)
  - (d) 36 in (915 mm)
3. How large should the characters be on the priority seating sign in the rail car?
  - (a) 1/4 in (6 mm) high
  - (b) 1/2 in (13 mm) high
  - (c) 5/8 in (16 mm) high
  - (d) 1 in (25 mm) high
4. Is an external speaker and public address system required on rapid rail cars that operate through stations having more than one line or route?
  - (a) Yes
  - (b) No

5. Where should the station name signs be placed on the walls of the stations when the train is next to the walls?
- (a) The top of the highest letter on the sign should be below the top of the vehicle windows and the bottom of the lowest letter should be above the horizontal center line of the vehicle window.
  - (b) The horizontal center line of the sign should be at the center of the vehicle window.
  - (c) The bottom of the sign should be at the bottom of the vehicle window.
  - (d) The sign should be higher than the top of the train.

**UNIT 6-3**  
**VEHICLE ENROUTE ACCESSIBILITY**  
**LIGHT RAIL VEHICLES**

**SCOPE**

The Department of Transportation rules implementing the vehicle accessibility requirements of ADA can be found at two levels of detail. The first area which addresses the more general requirements is 49 CFR Part 37, Subpart D - Acquisition of Accessible Vehicles by Public Entities and Subpart E - Acquisition of Accessible Vehicles by Private Entities. The second more specific design criteria is contained in 49 CFR Part 38, ADA Accessibility Specifications for Transportation Vehicles, Subpart D - Light Rail Vehicles and Systems.

**Slide 1**

This unit addresses all of the barriers that could be encountered by individuals with disabilities including individuals who use wheelchairs or mobility aids once they are on board the light rail vehicle. Barriers are encountered as an individual moves from the entry vestibule to the seating area, finds the priority seating and gets settled, moves between vehicles, collects information during the trip, and locates the desired destination.

This unit does not address the barriers encountered by individuals in wheelchairs or mobility aids as they board a light rail vehicle and get settled. That portion of the trip for individuals who use wheelchairs and mobility aids is addressed in Unit 5-4.

## **DEFINITIONS**

**Light Rail:** A streetcar-type vehicle operated on city streets, semi-exclusive rights of way, or exclusive rights of way. Service may be provided by step-entry vehicles or by level boarding.

**New Light Rail Vehicle:** A light rail vehicle which is offered for sale or lease after manufacture without any prior use.

**Used Light Rail Vehicle:** A light rail vehicle with prior use.

**Remanufactured Light Rail Vehicle:** A light rail vehicle which has been structurally restored and has had new or rebuilt major components installed to extend its service life by 5 years.

**Retrofitted Vehicle:** A vehicle that has been modified to the extent necessary to comply with the specific accessibility standards required by the One-Car-Per-Train Rule.

## APPLICABLE STANDARDS

49 CFR Part 37 Subpart D	Acquisition of Accessible Vehicles by Public Entities
49 CFR 37.79	Purchase and Lease of New Rail Vehicles by Public Entities Operating Rapid or Light Rail Systems
49 CFR 37.81	Purchase and Lease of Used Rail Vehicles by Public Entities Operating Rapid or Light Rail Systems
49 CFR 37.83	Purchase and Lease of Remanufactured Rail Vehicles by Public Entities Operating Rapid or Light Rail Systems
49 CFR 37.93	One Car Per Train Rule
49 CFR Part 38 Subpart D	Light Rail Vehicles and Systems
49 CFR 38.73	General
49 CFR 38.75	Doorways
49 CFR 38.77	Priority Seating Signs
49 CFR 38.79	Interior Circulation, Handrails and Stanchions
49 CFR 38.81	Lighting
49 CFR 38.83	Mobility Aid Accessibility
49 CFR 38.85	Between Car Barriers
49 CFR 38.87	Public Information Systems
10.3.1(5)	ADAAG Fixed Facilities and Stations, New Construction
10.3.2(2)	ADAAG Fixed Facilities and Stations, Existing Facilities, Key Stations



## PROBLEMS AND SOLUTIONS

The problems or barriers individuals with disabilities encounter once on board a light rail vehicle will be addressed at two levels of detail. The first level, General Requirements, addresses which light rail cars must be made accessible. To be considered accessible, new, used, and remanufactured light rail vehicles must comply with specific design requirements. The Specific Design Requirements, the second level of detail, address the design specifications for each element that is required for a light rail vehicle to be considered accessible.

### Checklist of Problems - General Requirements

- ☐ Accessibility of New Light Rail Vehicles
- ☐ Accessibility of Used Light Rail Vehicles
- ☐ Accessibility of Remanufactured Light Rail Vehicles
- ☐ One Car Per Train Rule

#### ☐ Accessibility of New Light Rail Vehicles

**Problem:** A public transit authority is preparing a specification to purchase new light rail vehicles. The solicitation is scheduled to be advertised publicly two months from now. Do the ADA Vehicle Specifications apply to this specification?

**Solution:** Yes, each public entity operating a light rail system making a solicitation after October 6, 1991 to purchase or lease a new light rail vehicle for use on the system shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities including individuals who use wheelchairs and complies with Part 38. [37.79]

#### ☐ Accessibility of Used Light Rail Vehicles

**Problem:** A public transit authority is negotiating with another transit authority to purchase some used light rail vehicles. Negotiations started two weeks ago and should be concluded by the end of next month. Will the purchasing authority have to make the used vehicles comply with the ADA Vehicle Standards?

**Solution:** Each public entity operating a light rail system that purchases or leases a used light rail vehicle after October 6, 1991 for use on its system shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities including individuals who use wheelchairs and complies with Part 38.

A public entity may purchase and lease a used light rail vehicle that is not readily accessible if after making demonstrated good faith efforts to obtain an accessible vehicle it is unable to do so.

**Note:** The one-car-per-train rule requires each public entity providing light rail service to ensure that each train consisting of two or more vehicles includes at least one car that is accessible as soon as practicable, but in no case later than July 25, 1995. Thus, care should be taken when planning for future fleet requirements. [37.93(c), 38.71(d)]

**Problem:** What are the good faith efforts that must be made when trying to purchase a readily accessible used light rail vehicle? How does the public entity document the good faith efforts?

**Solution:** Good faith efforts shall include at least the following steps:

- (1) The initial solicitation for the used vehicles published by the public entity must specify that all used vehicles were to be accessible to and usable by individuals with disabilities, or, if a solicitation is not used, a documented communication so stating;
- (2) A nationwide search for accessible vehicles, involving specific inquiries to manufacturers and other transit providers; and
- (3) Advertising in trade publications and contacting trade associations.

Each public entity purchasing or leasing used light rail vehicles that are not readily accessible to and usable by individuals with disabilities shall retain documentation of the specific good faith efforts it made for three years from the date the vehicles were purchased. These records shall be made available, on request, to the FTA Administrator and the public.

#### ☐ **Accessibility of Remanufactured Light Rail Vehicles**

**Problem:** A transit authority plans to remanufacture some of its light rail vehicles and purchase some remanufactured vehicles. Do the light rail vehicles have to meet the vehicle accessibility specifications?

**Solution:** Yes, if a light rail vehicle is remanufactured so as to extend its useful life for five years or more, it shall, to the maximum extent feasible be readily accessible to and usable to individuals with disabilities, including individuals who use wheelchairs.

It shall be considered feasible to remanufacture a light rail vehicle so as to be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless an engineering analysis demonstrates that doing so would have a significant adverse effect on the structural integrity of the vehicle.

**Problem:** One of the light rail lines on a particular system is included on the National Register of Historic Places. The vehicles operated on the lines are considered historic. The vehicles are scheduled to be remanufactured so that the service life can be extended for another seven years. Do these "historic vehicles" have to be made accessible?

Slide 2 **Solution:** If a public entity operates a light rail system any segment of which is included on the National Register of Historic Places and if making a light rail vehicle of historic character used solely on such segment readily accessible to and usable by individuals with disabilities would significantly alter the historic character of such vehicles, the public entity need only make (or purchase or lease a remanufactured vehicle with) those modifications that do not alter the historic character of such vehicles.

A public entity operating a fixed route system as described above may apply in writing to the FTA Administrator for a determination of the historic character of the vehicle. The FTA Administrator shall refer such requests to the National Register of Historic Places and shall rely on its advice in making a determination of the historic character of the vehicle.

#### ☐ **One-Car-Per-Train Rule**

**Problem:** What is the One-Car-Per-Train Rule and what are the dates for implementation?

**Solution:** Each public entity providing light rail service shall ensure that each train, consisting of two or more vehicles, includes at least one car that is readily accessible as soon as practicable but in no case later than July 25, 1995.

Existing vehicles which are retrofitted to comply with the "one-car-per-train rule" shall have priority seating signs [38.75], adequate handrails and stanchions and at least two areas for wheelchair or mobility aid users [38.77(c)], slip resistant floors [38.79(a)], and a level change mechanism or boarding device with sufficient clear width leading to at least two areas for wheelchair or mobility aid users [38.83(a)] At new and key stations, at least one door with proper signage [38.73(b)], 32 in (810 mm) wide [38.73(a)] and a horizontal gap no bigger than 4 in (100 mm) and vertical displacement no more than 2 in (50 mm). [38.73(d)] Vehicles previously designed and manufactured in accordance with the accessibility requirements of 49 CFR 609 or the Secretary of Transportation regulations implementing section 504 of the Rehabilitation Act of 1973 that were in effect before October 7, 1991, and which can be entered and used from stations in which they are to be operated, may be used to satisfy the requirements of § 37.93 of 49 CFR Part 37, the one-car-per-train rule

**Note:** If there are vehicles in your fleet which were deemed accessible under previous (504) rules, and they can be entered and used in the stations in which you now plan to operate them, they can be used to satisfy the one-car-per-train rule.

**Problem:** An agency is planning a new light rail system which will operate solely within exclusive right-of-way. Can mini-high platforms be used?

**Solution:** No. Systems which operate in exclusive rights-of-way, not on streets or pedestrian malls, shall be designed for level boarding.

**Problem:** A system operates two-car light rail trains with all vehicles purchased after October 6, 1991, and access is from a mini-high platform at one door of the first car. Each vehicle can accommodate two wheelchairs or mobility aid users, but three are waiting at one stop. Can the operator board two and tell the third to wait for the next train?

**Solution:** No. If all three can fit on the first car, the operator should board all three. If not, the train must be moved to allow the third person to board the second car.

**Note:** This illustrates a problem with mini-high platforms and wayside lifts. Be sure when purchasing new cars that each can accommodate the number of wheelchair or mobility aid users that could be expected. This will save having to move the train except in rare cases.

Problems and solutions related to specific design requirements address those barriers that disabled persons and persons in wheelchairs encounter from the time when they have boarded the vehicle and the doors have closed until they reach their intended station stop. These barriers are encountered as they move within the vehicle to get settled for the trip, as they move between vehicles and as they approach the various stops along their route. If portions of the vehicle are modified in such a way that it affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the specific design requirements.

#### Checklist of Problems - Specific Design Requirements

- ☐ Interior Circulation, Handrails and Stanchions
- ☐ Floors
- ☐ Thresholds
- ☐ Priority Seating
- ☐ Doorways Connecting Vehicles
- ☐ Public Information Systems
- ☐ Platform Signage

#### ☐ Interior Circulation, Handrails and Stanchions

**Problem:** Once on the vehicle, it is difficult to move about within the vehicle when it is moving, accelerating or decelerating.

Slide 3 **Solution:** Handrails and stanchions shall be provided to assist safe boarding, on board circulation, seating and standing assistance and alighting by persons with disabilities. [38.77]

**Problem:** Once on board the light rail vehicle, many times it will start to move before the person with a disability pays the fare. The sudden start of the vehicle makes it very difficult for some people to hold their balance. If the vehicle has to slow down, there is a possibility the person could be thrown forward into the front window of the vehicle.

**Solution:** On light rail vehicles where on-board fare collection devices are used, a horizontal passenger assist shall be located between boarding passengers and the fare collection device and shall prevent passengers from sustaining injuries on the fare collection device or windshield in the event of a sudden deceleration. Without restricting the vestibule space, the assist shall provide support for a boarding passenger from the door through the boarding procedure. Passengers shall be able to lean against the assist for security while paying fares. [38.77]

**Problem:** Some of the handrails are difficult to grasp. Some are square with sharp edges which seem to be dangerous if a person was to fall on them.

Slide 4 **Solution:** Handrails shall have a cross-sectional diameter between 1-1/4 in (32 mm) and 1-1/2 in (38 mm) or shall provide an equivalent grasping surface and have eased edges with corner radii of not less than 1/8 in (3 mm). Handrails shall be placed to provide a minimum 1-1/2 in (38 mm) knuckle clearance from the nearest adjacent surface. [38.77]

## ☐ Floors

**Problem:** Some floors become quite slippery when they are wet. Others are so smooth that even when they are dry, they are slippery. Are there standards which must be followed on rail vehicles which prescribe what type of material should be used on the floors?

Slide 5 **Solution:** Floor surfaces on aisles, places for standees, and areas where wheelchairs and mobility aid users are to be accommodated are to be slip resistant on all light rail vehicles. [38.79(a)]

**Problem:** In developing a specification for a new bus procurement, what standard should be used to ensure that the floor area and steps are provided with the mandated "slip resistant" surface?

**Solution:** There is no specific requirement, but an appendix note recommends the coefficient of friction as the appropriate descriptor to measure slip resistance. The coefficient of friction is the ratio between the force necessary to move one surface over another surface and the pressure between the two surfaces. For example, the coefficient of friction for cast iron on oak is 38:100 or 0.38. A research project conducted with persons with disabilities concluded that a static coefficient of friction of 0.6 was appropriate for steps, floors and lift platforms and a coefficient of friction of 0.8 was desirable for ramps.

**Problem:** The design of the new rail vehicles calls for carpet on the floor. People who use wheelchairs and mobility aids could have a problem with a carpeted floor especially if the pile of the carpet is very thick. Are there standards that prohibit carpet?

Slide 6 **Solution:** The ADA Accessibility Specifications for Transportation Vehicles does not address carpeted floors. A guideline that could be used is Section 4.5.3 of the ADA Accessibility Guidelines for Buildings and Facilities which states: If a carpet or carpet tile is used on a ground or floor surface, then it shall be securely attached; have a firm cushion, pad, or backing or no cushion or pad; and have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum pile thickness shall be 1/2 in (13 mm). Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim up to 1/4 in (6 mm) high can be vertical. If the edge trim is between 1/4 in (6 mm) and 1/2 in (13 mm) a bevel with a slope no greater than 1:2 shall be used.

## ☐ Thresholds

**Problem:** It is difficult for people with vision impairments to see as they approach a threshold when moving about within or between light rail vehicles. Even though the threshold is beveled with a slope no greater than 1:2 as required by the ADAAG for Buildings and Facilities, it can still cause a tripping hazard for people with poor vision as they walk on the moving train.

Slide 7 **Solution:** All thresholds and step edges on light rail vehicles shall have a band of color(s) running the full width of the threshold which contrasts with the adjacent floor, either light on-dark or dark-on-light. [38.79]

While not required, an appendix note recommends that the material used should contrast by at least 70%. Percent contrast is determined by the following equation:

$$\text{Contrast} = \frac{B_1 - B_2}{B_1} \times 100$$

where  $B_1$  is the Light Reflectance Value of the lighter area and  $B_2$  is the Light Reflectance Value of the darker area. Note that in any application both white and black are never absolute: thus  $B_2$  never equals 100 and  $B_1$  is always greater than zero. [Appendix Part 38]



## ☐ Priority Seating

**Problem:** Once on the light rail vehicle, it is difficult to tell where the priority seating is located. The priority seating signs are often missing and on some vehicles they have never been installed.

**Solution:** Each light rail vehicle shall contain sign(s) which indicate that certain seats are priority seats for persons with disabilities and that other passengers should make such seats available to those who wish to use them. [38.75]

**Problem:** Many of the priority seating signs are so small that people with vision impairments cannot read them. Also, on some vehicles, the priority seating sign background is the same color as the wall it is mounted on which makes it difficult to see.

Slide 8 **Solution:** Characters on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case "X") of 5/8 in (16 mm) with "wide" spacing (generally, the space between letters shall be 1/16 the height of upper case letters), and shall contrast with the background either light-on-dark or dark-on-light. [38.75]

Raised or Braille characters or pictorial symbol signs, are not required, but could be used to make it easier for persons with low vision or persons who are blind to tell where the priority seating is located. If a pictorial symbol is used, the international symbol of accessibility should be used. The border dimension of the pictorial shall be 6 in (152 mm) minimum in height. If raised letters are used they shall be raised 1/32 in (0.8 mm), upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille. The raised characters shall be at least 5/8 in (16 mm) high but no higher than 2 in (50 mm).

## ☐ Doorways Connecting Vehicles

**Problem:** If there is an emergency situation in one of the vehicles of a multi-car train, even though the aisle widths are wide enough for a wheelchair or a mobility aid to negotiate, once the person in the wheelchair reaches the door at the end of the car it is too narrow to allow passage.

**Solution:** If doorways connecting adjoining cars in a multi-car train are provided, and if such doorway is connected by an aisle with a minimum clear width of 30 in (765 mm) to one or more spaces where wheelchair or mobility aid users can be accommodated, then such doorway on new vehicles shall have a minimum clear opening of 30 in (765 mm) to permit wheelchair and mobility aid users to be evacuated to an adjoining vehicle in an emergency. [38.73]



☐ **Public Information Systems**

**Problem:** When on the light rail vehicle it is difficult for persons with disabilities to tell when they should start getting ready to exit the train. Also, even though many of the vehicles have internal speakers, these speakers cannot be heard by persons with hearing impairments.

Slide 9 **Solution:** Each vehicle shall be equipped with an interior public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted. [38.87]

## ☐ Platform Signage

**Problem:** When the train pulls into a station, it is difficult to see what station it is in because the station identification signs are too high. The only way to see them is to squat down and look up and out of the windows. Some stations don't have enough station identification signs so only every other car can see them.

**Solution:** New stations built after January 25, 1992, and key stations on light rail systems shall have identification signs complying with requirements for character proportion and height, finish and contrast of ADAAG for Buildings and Facilities. Signs shall be placed at frequent intervals and shall be clearly visible from within the vehicle on both sides when not obstructed by another train. When station identification signs are placed close to vehicle windows (i.e., on the side opposite from boarding), each shall have the top of the highest letter or symbol below the top of the vehicle window and the bottom of the lowest letter or symbol above the horizontal mid-line of the vehicle window. [10.3.1(5), 10.3.2(2)]

Station identification signs shall be designed to comply with the following signage standards.

**Character Proportion:** Letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10.

**Character Height:** Characters and numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case X. Lower case characters are permitted. If the sign is suspended above the finished floor, 80 in (2030 mm), complying with minimum headroom, the minimum character height shall be 3 in (75 mm).

**Finish and Contrast:** The characters and background of signs shall be eggshell, matte, or other non-glare finish. Characters and symbols shall contrast with their background - either light characters on a dark background or dark characters on a light background. [10.3.1(5), 10.3.2.(2), 4.30.1, 4.30.2, 4.30.3, 4.30.5]

## EXERCISES

1. Provide a listing of the elements that must be addressed in the retrofit of a light rail vehicle for compliance with the One-Car-Per-Train Rule.
2. On a light rail vehicle with onboard fare collection, what are the requirements for handrails around the fare collection area?
  - (a) A horizontal handrail should be placed around the fare box.
  - (b) A vertical stanchion should be placed on each corner of the fare box.
  - (c) A horizontal handrail should be located across the front of the vehicle between boarding passengers and the fare box.
3. What should the maximum diameter of the handrails be on a light rail vehicle?
  - (a) 1 in (25 mm)
  - (b) 1-1/2 in (38 mm)
  - (c) 2 in (50 mm)
  - (d) 5/8 in (16 mm)
4. What is the maximum height of the characters on the priority seating sign that is installed in the light rail vehicle?
  - (a) 1/2 in (12 mm)
  - (b) 5/8 in (16 mm)
  - (c) 1 in (25 mm)
  - (d) 1-1/2 in (38 mm)

5. How wide should the doors between the light rail vehicles be so that a wheelchair can pass from one car to another?
- (a) 27 in (685 mm)
  - (b) 32 in (815 mm)
  - (c) 36 in (915 mm)
  - (d) 30 in (765 mm)
6. Where should the station name signs be placed on the walls of the stations when the train is next to the walls?
- (a) The top of the highest letter on the sign should be below the top of the vehicle window and the bottom of the lowest letter should be above the horizontal center line of the vehicle window.
  - (b) The horizontal center line of the sign should be at the center of the vehicle window.
  - (c) The bottom of the sign should be at the bottom of the vehicle window.
  - (d) The sign should be higher than the top of the train.



UNIT 6-4  
VEHICLE ENROUTE ACCESSIBILITY  
COMMUTER RAIL CARS

**SCOPE**

The Department of Transportation rules implementing the vehicle accessibility requirements of ADA can be found at two levels of detail. The first area which addresses the more general requirements is 49 CFR Part 37, Subpart D - Acquisition of Accessible Vehicles by Public Entities and Subpart E - Acquisition of Accessible Vehicles by Private Entities. The second more specific design criteria is contained in 49 CFR Part 38, ADA Accessibility Specifications for Transportation Vehicles, Subpart E - Commuter Rail Cars and Systems.

**Slide 1**

This unit addresses all of the barriers that could be encountered by individuals with disabilities including individuals who use wheelchairs and mobility aids once they are on board the commuter rail car. Barriers are encountered as the individual moves from the entrance vestibule to the seating area, finds the priority seating area and gets settled, moves between cars, utilizes the restrooms when restrooms are provided, gathers information during the trip and locates the desired destination.

This unit does not address the barriers encountered by individuals in wheelchairs or mobility aids as they board a commuter rail car and get settled. That portion of the trip for individuals who use wheelchairs and mobility aids is addressed in Unit 5-4.

## **DEFINITIONS**

**Commuter Rail:** Short haul passenger service operating in metropolitan and suburban areas, whether within or across the geographical boundaries of a state, usually characterized by reduced fare, multiple ride, and commutation tickets and by morning and evening peak period operations.

**New Commuter Rail Vehicle:** A commuter rail vehicle which is offered for sale or lease after manufacture without any prior use.

**Used Commuter Rail Vehicle:** A commuter rail vehicle with prior use.

**Remanufactured Commuter Rail Vehicle:** A commuter rail vehicle which has been structurally restored and has had new or rebuilt major components installed to extend its service life by 15 years.

**Retrofitted Vehicle:** A vehicle that has been modified to the extent necessary to comply with the specific accessibility standards required by the One-Car-Per-Train Rule.

## APPLICABLE STANDARDS

49 CFR Part 37 Subpart E	Acquisition of Accessible Vehicles by Public Entities
49 CFR 37.85	Purchase and Lease of New Intercity and Commuter Rail Cars
49 CFR 37.87	Purchase and Lease of Used Intercity and Commuter Rail Cars
49 CFR 37.89	Purchase and Lease of Remanufactured Intercity and Commuter Rail Cars
49 CFR 37.93	One-Car-Per-Train Rule
49 CFR Part 38 Subpart E	Commuter Rail Cars and Systems
49 CFR 38.91	General
49 CFR 38.93	Doorways
49 CFR 38.95	Mobility Aid Accessibility
49 CFR 38.97	Interior Circulation, Handrails and Stanchions
49 CFR 38.99	Floors, Steps and Thresholds
49 CFR 38.101	Lighting
49 CFR 38.103	Public Information Systems
49 CFR 38.105	Priority Seating Signs
49 CFR 38.107	Restrooms
49 CFR 38.109	Between Car Barriers
10.3.1(5)	ADAAG Fixed Facilities and Stations, New Construction
10.3.2(2)	ADAAG Fixed Facilities and Stations, Existing Facilities and Key Stations



## PROBLEMS AND SOLUTIONS

The problems or barriers individuals with disabilities encounter once on board a commuter rail car will be addressed at two levels of detail. The General Requirements address which rail cars must be made accessible. To be considered accessible, new, used and remanufactured commuter rail cars must comply with specific design requirements. The Specific Design Requirements address the design specifications for each element that is required for a commuter rail car to be considered accessible.

### Checklist of Problems - General Requirements

- ☐ Accessibility of New and Used Commuter Rail Cars
- ☐ Accessibility of Remanufactured Commuter Rail Cars
- ☐ One-Car-Per-Train Rule

### ☐ Accessibility of New and Used Commuter Rail Cars

**Problem:** Do new commuter rail cars have to be accessible?

**Solution:** A commuter authority making a solicitation after October 6, 1991, to purchase or lease a new commuter rail car for use on the system shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs and complies with Part 38.

**Problem:** If a public entity purchases used commuter rail cars, do they have to be accessible?

**Solution:** A commuter authority purchasing or leasing a used commuter rail car after August 25, 1990, shall ensure that the car is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs and complies with Part 38.

A commuter authority may purchase or lease a used commuter rail car that is not readily accessible to and usable by individuals with disabilities if, after making demonstrated good faith efforts to obtain an accessible vehicle, it is unable to do so.

Note: If there is a choice between cars, the car which comes closest to complying should be chosen.

**Problem:** What constitutes "demonstrated good faith efforts" to obtain an accessible vehicle?

**Solution:** Good faith efforts shall include at least the following steps:

- (1) An initial solicitation for the used vehicles published by the commuter authority must specify that all used vehicles were to be accessible to and usable by individuals with disabilities;
- (2) A nationwide search for accessible vehicles, involving specific inquiries to used vehicle dealers and other transit providers; and
- (3) Advertising in trade publications and contacting trade associations.

Commuter authorities purchasing or leasing used commuter rail cars that are not readily accessible to and usable by individuals with disabilities shall retain documentation of the specific good faith efforts it made for three years from the date the vehicles were purchased or leased. These records shall be made available, on request, to the Federal Railroad Administration or FTA Administrator, as applicable. These records shall be made available to the public, on request.

#### ☐ **Accessibility of Remanufactured Commuter Rail Cars**

**Problem:** If a commuter rail car is scheduled to be remanufactured, does the scope of the remanufacturing project have to address all of the accessibility specifications?

**Solution:** If a commuter rail authority remanufactures or purchases or leases a remanufactured car which has its life extended by ten years or more, the commuter rail cars shall, to the maximum extent feasible, be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

It shall be considered feasible to remanufacture a commuter rail car so as to be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless an engineering analysis demonstrates that remanufacturing the car to be accessible would have a significant adverse effect on the structural integrity of the car.

## ☐ One-Car-Per-Train Rule

**Problem:** What is the One-Car-Per-Train Rule and what are the dates for implementation?

**Solution:** Each commuter rail authority shall ensure that each train has one car that is readily accessible as soon as practicable but in no case later than July 26, 1995.

Existing vehicles retrofitted to comply with the "one-car-per-train" rule shall have a level change mechanism or boarding device with sufficient clearance to permit a wheelchair or mobility aid user to reach a seating location and at least two wheelchair or mobility aid seating locations [38.95(a)], proper signage on the exterior of the appropriate doors [38.93(e)], an accessible restroom if restrooms are provided for the general public [38.107], and a horizontal gap no bigger than 4 in (100 mm) and vertical displacement no more than 2 in (50 mm) at new and key stations. [38.9(d)] Vehicles previously designed and manufactured in accordance with the program accessibility requirements of Section 504 of the Rehabilitation Act of 1973, or implementing regulations of the Secretary of Transportation that were in effect before October 7, 1991; and which can be entered and used from stations in which they are to be operated, may be used to satisfy the requirements of § 37.93 of 49 CFR Part 37.

**Note:** If there are cars in your fleet which were deemed accessible under previous (504) rules, and they can be entered and used in the stations in which you now plan to operate them, they can be used to satisfy the one-car-per-train rule.

Problems and solutions related to specific design requirements address those barriers that disabled persons and persons in wheelchairs encounter from the time when they have boarded the vehicle and the doors have closed until they reach their intended station stop. These barriers are encountered as they move within the vehicle to get settled for the trip, as they move between vehicles and as they approach the various stops along their route. If portions of the car are modified in such a way that it affects or could affect accessibility, each such portion shall comply, to the extent practicable, with specific design requirements. This does not require that inaccessible cars be retrofitted with lifts, ramps, or other boarding devices.

### Checklist of Problems - Specific Design Requirements

- ☐ Interior Circulation, Handrails and Stanchions
- ☐ Passageways
- ☐ Seating Location
- ☐ Floors
- ☐ Thresholds
- ☐ Priority Seating
- ☐ Doorways Connecting Vehicles
- ☐ Public Information Systems
- ☐ Platform Signage
- ☐ Restrooms

### ☐ Interior Circulation, Handrails and Stanchions

**Problem:** On many commuter rail cars, the aisleways in the passenger compartment are narrow and there are no handrails or stanchions. Handrails and stanchions have been installed in some cars which made it more difficult for persons using wheelchairs and mobility aids to get to the seating area.

**Solution:** When handrails or stanchions are provided on commuter rail cars within the passenger compartment, they shall be placed to permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a seating location from an accessible entrance. [38.97]

**Problem:** Some of the handrails are difficult to grasp. Some are square with sharp edges which seem to be dangerous if a person were to fall on them.

Slide 2 **Solution:** Handrails shall have a cross-sectional diameter between 1-1/4 in (32 mm) and 1-1/2 in (38 mm) or shall provide an equivalent grasping surface and have eased edges with corner radii of not less than 1/8 in (3 mm). Handrails shall be placed to provide a minimum 1-1/2 in (38 mm) knuckle clearance from the nearest adjacent surface. [38.77]

Note: Handrails in doorways must comply with FRA regulations. There is a different requirement which must be consistent with 49 CFR Parts 229 and 231.

## ☐ Passageways

**Problem:** The passageways between the entrance door of commuter rail cars and the accessible seating locations are sometimes too narrow for a wheelchair or mobility aid to use.

Slides 3, 4 **Solution:** A route at least 32 in (815 mm) wide shall be provided from the accessible entrance door on the car to the accessible seating locations. [38.93(b)]

If passage is required through a vestibule, such vestibule in new cars shall have a minimum width of 42 in (1070 mm). [38.93(b)]

## ☐ Seating Location

**Problem:** Even when there is sufficient width to access the rail car, it is difficult to maneuver into an area when a person wants to remain in the wheelchair.

Slide 5 **Solution:** Spaces for persons who wish to remain in their wheelchairs or mobility aids shall have a minimum clear floor space 48 in (1220 mm) by 30 in (760 mm). Such spaces shall adjoin, and may overlap, an accessible path. Not more than 6 in (150 mm) of the required clear floor space may be accommodated for footrests under another seat provided there is a minimum of 9 in (230 mm) from the floor to the lowest part of the seat overhanging the space. Seating spaces may have fold-down or removable seats to accommodate other passengers when a wheelchair or mobility aid user is not occupying the area, provided the seats, when folded up, do not obstruct the clear floor space required. [38.95(d)]

## ☐ Floors

**Problem:** Some floors become quite slippery when they are wet. Others are so smooth that even when they are dry, they are slippery. Are there standards which must be followed on rail vehicles which prescribe what type of material should be used on the floors?

Slide 6 **Solution:** Floor surfaces on aisles, places for standees, and areas where wheelchairs and mobility aid users are to be accommodated are to be slip resistant on all commuter rail cars. [38.99(a)]

**Problem:** In developing a specification for a new commuter rail car procurement, what standard should be used to ensure that the floor area and steps are provided with the mandated "slip resistant" surface?

**Solution:** There is no specific requirement, but an appendix note recommends the coefficient of friction as the appropriate descriptor to measure slip resistance. The coefficient of friction is the ratio between the force necessary to move one surface over another surface and the pressure between the two surfaces. For example, the coefficient of friction for cast iron on oak is 38:100 or 0.38. A research project conducted with persons with disabilities concluded that a static coefficient of friction of 0.60 was appropriate for steps, floors and lift platforms and a coefficient of friction of 0.80 was desirable for ramps.

**Problem:** The design of the new commuter rail cars calls for carpet on the floor. People who use wheelchairs and mobility aids could have a problem with a carpeted floor especially if the pile of the carpet is very thick. Are there standards that prohibit carpet?

Slide 7 **Solution:** The ADA Accessibility Specifications for Transportation Vehicles do not address carpeted floors. A guideline that could be used is Section 4.5.3 of the ADA Accessibility Guidelines for Buildings and Facilities which states: If a carpet or carpet tile is used on a ground or floor surface, then it shall be securely attached; have a firm cushion, pad, or backing or no cushion or pad; and have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum pile thickness shall be 1/2 in (13 mm). Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim up to 1/4 in (6 mm) high can be vertical. If the edge trim is between 1/4 in (6 mm) and 1/2 in (13 mm) a bevel with a slope no greater than 1:2 shall be used.

## ☐ Thresholds

**Problem:** It is difficult for people with vision impairments to see as they approach a threshold when moving about within or between commuter rail cars. Even though the threshold is beveled with a slope no greater than 1:2 as required by the ADAAG for Buildings and Facilities, it can still cause a tripping hazard for people with poor vision as they walk on the moving train.

Slide 8 **Solution:** All thresholds and step edges on commuter rail cars shall have a band of color(s) running the full width of the threshold which contrasts with the adjacent floor, either light on-dark or dark-on-light. [38.79]

An appendix note recommends that the material used contrast by at least 70%. Percent contrast is determined by the following equation:

$$\text{Contrast} = \frac{B_1 - B_2}{B_1} \times 100$$

where  $B_1$  is the Light Reflectance Value of the lighter area and  $B_2$  is the Light Reflectance Value of the darker area. Note that in any application both white and black are never absolute: thus  $B_2$  never equals 100 and  $B_1$  is always greater than zero. [Appendix Part 38]

## ☐ Priority Seating

**Problem:** Once on the commuter rail car, it is difficult to tell where the priority seating is located. The priority seating signs are often missing and on some cars they have never been installed.

**Solution:** Each commuter rail car shall contain sign(s) which indicate that certain seats are priority seats for persons with disabilities and that other passengers should make such seats available to those who wish to use them. [38.105]

**Problem:** Many of the priority seating signs are so small that people with vision impairments cannot read them. Also, on some vehicles, the priority seating sign background is the same color as the wall it is mounted on which makes it difficult to see.

Slide 9 **Solution:** Characters on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case "X") of 5/8 in (16 mm) with "wide" spacing (generally, the space between letters shall be 1/16 the height of upper case letters), and shall contrast with the background either light-on-dark or dark-on-light. [38.105]

Raised or Braille characters or pictorial symbol signs, are not required, but could be used to make it easier for persons with low vision or persons who are blind to tell where the priority seating is located. If a pictorial symbol is used, the international symbol of accessibility should be used. The border dimension of the pictorial shall be 6 in (152 mm) minimum in height. If raised letters are used they shall be raised 1/32 in (0.8 mm), upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille. The raised characters shall be at least 5/8 in (16 mm) high but no higher than 2 in (50 mm).

#### ☐ **Doorways Connecting Vehicles**

**Problem:** If there is an emergency situation in one of the cars of a multi-car train, even though the aisle widths are wide enough for a wheelchair or a mobility aid to negotiate, once the person in the wheelchair reaches the door at the end of the car it is too narrow to allow passage.

Slide 10 **Solution:** If doorways connecting adjoining cars in a multi-car train are provided, and if such doorway is connected by an aisle with a minimum clear width of 30 in (765 mm) to one or more spaces where wheelchair or mobility aid users can be accommodated, then such doorway shall have, to the maximum extent practicable in accordance with the regulations issued under the Federal Railroad Safety Act of 1970 (49 CFR Parts 229 and 231), a clear opening of 30 in (765 mm). [38.73]



☐ **Public Information Systems**

**Problem:** When on the commuter rail car it is difficult for persons with disabilities to tell when they should start getting ready to exit the train. Also, even though many of the cars have internal speakers, these speakers cannot be heard by persons with hearing impairments.

**Solution:** Each car shall be equipped with an interior public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted. [38.103]

Slide 11

## □ Platform Signage

**Problem:** When the train pulls into a station, it is difficult to see what station it is in because the station identification signs are too high. The only way to see them is to squat down and look up and out of the windows. Some stations don't have enough station identification signs so only every other car can see them.

**Solution:** New stations built after October 7, 1991, and key stations on commuter rail systems shall have identification signs complying with requirements for character proportion, height, finish, and contrast of ADAAG for Buildings and Facilities. Signs shall be placed at frequent intervals and shall be clearly visible from within the car on both sides when not obstructed by another train. When station identification signs are placed close to vehicle windows (i.e., on the side opposite from boarding), each shall have the top of the highest letter or symbol below the top of the car window and the bottom of the lowest letter or symbol above the horizontal mid-line of the vehicle window. [10.3.1(5), 10.3.2(2)]

Station identification signs shall be designed to comply with the following signage standards.

**Character Proportion:** Letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10.

**Character Height:** Characters and numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case X. Lower case characters are permitted. If the sign is suspended above the finished floor, at least 80 in (2030 mm), complying with minimum headroom, the minimum character height shall be 3 in (75 mm).

**Finish and Contrast:** The characters and background of signs shall be eggshell, matte, or other non-glare finish. Characters and symbols shall contrast with their background - either light characters on a dark background or dark characters on a light background. [10.3.1(5), 10.3.2.(2), 4.30.1, 4.30.2, 4.30.3, 4.30.5]

## ☐ Restrooms

Slide 12 **Problem:** On the commuter rail car the path of travel to the restroom is restricted and the restroom layout is such that it is very difficult to use for persons in wheelchairs. Are restrooms required on commuter rail cars and if required, should they be made accessible to persons in wheelchairs and mobility aids?

**Solution:** If a restroom is provided for the general public, it shall be designed so as to allow a person using a wheelchair or mobility aid to enter and use such a restroom. Restrooms required to be accessible shall be in close proximity to at least one seating location for persons using mobility aids and shall be connected to such a space by an unobstructed path having a minimum width of 32 in (815 mm). [38.107(a)(b)]

**Problem:** The maneuvering space outside of the restroom on a commuter rail car is generally quite restricted. Because of this, coupled with the layout inside of the restroom, sometimes a normal 32 in (815 mm) wide doorway is not wide enough to permit a wheelchair to maneuver through the door.

**Solution:** Doorways on the end of the enclosure, opposite the water closet, shall have a minimum clear opening width of 32 in (815 mm). Doorways on the side wall shall have a minimum clear opening width of 39 in (990 mm). Door latches and hardware shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. [38.107(a)(5)]

**Problem:** The floor space inside most rail car restrooms is extremely restricted and there is not enough room to maneuver around to position the wheelchair. What is the minimum required clear floor area for an accessible restroom in a commuter rail car? Can any of the fixtures that hang from the wall share this space? Can fold-away fixtures be used that overlap the clear floor space?

**Solution:** The minimum clear floor area shall be 35 in (890 mm) by 60 in (1525 mm). Permanently installed fixtures may overlap this area a maximum of 8 in (200 mm), if the lowest portion of the fixture is a minimum of 9 in (230 mm) above the floor, and may overlap a maximum of 19 in (485 mm), if the lowest portion of the fixture is a minimum of 29 in (735 mm) above the floor, provided such fixtures do not interfere with access to the water closet. Fold-down or retractable seats or shelves may overlap the clear floor space at a lower height provided they can be easily folded up or moved out of the way. [38.107(a)(1)]

**Note:** These are minimum requirements and are quite difficult for many people to use. Larger restrooms should be provided where possible.

**Problem:** The height of an accessible water closet specified in ADAAG for Buildings and Facilities is 17 to 19 in (430 to 485 mm). Is this height the same for accessible built-in water closets like the type used in rail cars?

**Solution:** The height of the water closet shall be 17 in (430 mm) to 19 in (485 mm) measured to the top of the toilet seat. Seats shall not be spring loaded to return to a lifted position. [38.107(a)(2)]

**Problem:** In ADAAG for Buildings and Facilities, specific grab bars are required around the water closet area. Since water closets on rail cars are usually built in and the space is quite restricted, are grab bars required? If so, where should they be located and how long should they be?

**Solution:** A grab bar at least 24 in (610 mm) long shall be mounted behind the water closet, and a horizontal grab bar at least 40 in (1015 mm) shall be mounted on at least one side wall, with one end not more than 12 in (305 mm) from the back wall, at a height between 33 in (840 mm) and 36 in (915 mm) above the floor. [38.107(a)(3)]

**Problem:** Many times the faucets and flush controls are hard to reach and even if you can reach them, they are very difficult to operate.

**Solution:** Faucets and flush controls shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2N). Controls for flush valves shall be mounted no more than 44 in (1115 mm) above the floor. [38.107(a)(4)]

## EXERCISES

1. Provide a listing of the elements that must be addressed in the retrofit of a commuter rail car for compliance with the One-Car-Per-Train Rule.
2. If handrails are provided on a commuter rail car, where should they be placed so that they comply with the ADA requirements?
  - (a) Handrails shall be placed above each side of the aisleway.
  - (b) Handrails shall be placed to permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a seating location from an accessible entrance.
  - (c) Handrails shall be placed along the center of the aisle over each seat.
3. How wide should the passageway be from the accessible doors to the accessible seating locations on a commuter rail car?
  - (a) 27 in (685 mm)
  - (b) 30 in (765 mm)
  - (c) 32 in (815 mm)
  - (d) 36 in (915 mm)
4. How much space should be provided for individuals who use wheelchairs in the seating area of a commuter rail car?
  - (a) 30 in (765 mm) by 48 in (1220 mm)
  - (b) 32 in (815 mm) by 48 in (1220 mm)
  - (c) 36 in (915 mm) by 36 in (915 mm)
  - (d) 48 in (1220 mm) by 60 in (1525 mm)

5. How large should the characters on the priority seating sign be on a commuter rail car?
- (a) 5/8 in (16 mm)
  - (b) 1/2 in (12 mm)
  - (c) 1 in (25 mm)
  - (d) 1-1/2 in (38 mm)
6. How wide should the doorway be which connects adjoining cars, when the cars are new?
- (a) 27 in (685 mm)
  - (b) 30 in (765 mm)
  - (c) 32 in (815 mm)
  - (d) 36 in (915 mm)
7. Where should the station name signs be placed on the walls of the station when the train is next to the walls?
- (a) The sign should be higher than the top of the train.
  - (b) The horizontal centerline of the sign should be at the center of the car window.
  - (c) The bottom of the sign should be at the bottom of the car window.
  - (d) The top of the highest letter on the sign should be below the top of the vehicle window and the bottom of the lowest letter on the sign should be above the horizontal centerline of the vehicle window.
8. What is the minimum clear floor area of a restroom on a commuter rail car?
- (a) 35 in (890 mm) by 60 in (1525 mm)
  - (b) 48 in (1220 mm) by 60 in (1525 mm)
  - (c) 60 in (1525 mm) by 60 in (1525 mm)



**UNIT 6-5**  
**VEHICLE ENROUTE ACCESSIBILITY**  
**INTERCITY RAIL CARS**

**SCOPE**

The Department of Transportation rules implementing the vehicle accessibility requirements of ADA can be found at two levels of detail. The first area which addresses the more general requirements is 49 CFR Part 37, Subpart D - Acquisition of Accessible Vehicles by Public Entities and Subpart E - Acquisition of Accessible Vehicles by Private Entities. The second more specific design criteria is contained in 49 CFR Part 38, ADA Accessibility Specifications for Transportation Vehicles, Subpart F - Intercity Rail Cars and Systems.

This unit addresses all of the barriers that could be encountered by individuals with disabilities including individuals who use wheelchairs or mobility aids once they are on board the intercity rail car. Barriers are encountered as the individual moves from the entrance area to the seating area or sleeping compartment, gets settled in the desired location, moves between rail cars, utilizes the restrooms in the coach car or the restroom in the sleeping compartment, gathers information along the trip and locates the desired destination.

This unit does not address the barriers encountered by individuals in wheelchairs or mobility aids as they board an intercity rail car and get settled. That portion of the trip for individuals who use wheelchairs and mobility aids is addressed in Unit 5-4.



## **DEFINITIONS**

**Intercity Rail Passenger Car:** A rail car intended for use by revenue passengers, obtained by the National Railroad Passenger Corporation (Amtrak) for use in intercity rail transportation.

## **APPLICABLE STANDARDS**

49 CFR Part 38 Subpart F	Intercity Rail Cars and Systems
49 CFR 38.111	General
49 CFR 38.113	Doorways
49 CFR 38.115	Interior Circulation, Handrails and Stanchions
49 CFR 38.117	Floors, Steps and Thresholds
49 CFR 38.119	Lighting
49 CFR 38.121	Public Information Systems
49 CFR 38.123	Restrooms
49 CFR 38.125	Mobility Aid Accessibility
49 CFR 38.127	Sleeping Compartments
10.3.1(5)	ADAAG Fixed Facilities and Stations, New Construction

## PROBLEMS AND SOLUTIONS

New, used and remanufactured intercity rail cars shall comply with specific design requirements to be considered accessible. The elements that must be made accessible vary depending on the type and use of the car and if the car is to be modified or retrofitted. This General Requirements section identifies the various types of cars and provides guidance on the elements that must be made accessible.

### Checklist of Problems - General Requirements

- ☐ Single-Level Rail Passenger Coaches and Food Service Cars
- ☐ Single-Level Dining and Lounge Cars
- ☐ Bi-Level Dining Cars
- ☐ Bi-Level Lounge Cars
- ☐ Sleeper Cars
- ☐ Car Modifications
- ☐ Car Retrofits

#### ☐ Single-Level Rail Passenger Coaches and Food Service Cars

**Problem:** On short intercity rail trips, the most common car used is the passenger coach car. Once on the coach car, it is sometimes difficult for persons in wheelchairs to obtain refreshments from the food service car.

**Solution:** Single-level passenger coaches and food service cars (other than single-level dining cars) shall comply with the following sections of ADAAG for Vehicles:

38.113	Doorways
38.115	Interior Circulation, Handrails and Stanchions
38.117	Floors, Steps and Thresholds
38.119	Lighting
38.121	Public Information Systems
38.123	Restrooms

Compliance with Section 38.125 Mobility Aid Accessibility shall be required only to the extent necessary to afford at least one but not more than two wheelchair seating locations on the passenger coach or food service car. The spaces for persons wishing to remain in their wheelchair shall have a minimum clear floor area of 48 in (1220 mm) by 30 in (765 mm). Such space may have fold-down seats for use when not occupied by a wheelchair. In addition, at least one, but not more than two seating location(s) for individuals who wish to transfer from their wheelchairs shall include a regular coach seat or dining car booth or table seat and space to fold and store the passenger's wheelchair. The wheelchair spaces and seating locations shall adjoin or overlap an accessible route with a minimum clear width of 32 in (815 mm). [38.125(d)(2) and 38.125(d)(3)]

Note: The DOT rule requires personnel to serve passengers with disabilities at their seats, including a hard surface (e.g., tray), if they can't, or don't want to, go to the food service area.

#### ☐ **Single-Level Dining and Lounge Cars**

**Problem:** When single-level dining cars are available on the train, they are sometimes difficult to gain access to, especially for people in wheelchairs and mobility aids because the connecting doorway between the coach car and the dining car is too narrow. Even when the dining car is accessible, sometimes there is no place for a person in a wheelchair to use.

**Solution:** Single-level dining and lounge cars shall have at least one connecting doorway at the end of the car connecting the adjacent car. The doorway shall have a clear width of 32 in (815 mm) to permit wheelchair and mobility aid users to enter into the single-level dining car. [38.113(a)(2)] Single-level dining cars shall have at least one space for persons who wish to remain in their wheelchairs. The space shall have a minimum clear floor area of 48 in (1220 mm) by 30 in (765 mm). Such space may have fold-down or removable seats for use when not occupied by a wheelchair. In addition, at least one dining booth or table seat shall be provided for individuals who wish to transfer from their wheelchair. A space to fold or store the passenger's wheelchair shall also be provided. [38.125(d)(2) and (3)]

#### ☐ **Bi-Level Dining Cars**

**Problem:** Bi-level dining cars are difficult to access. Barriers sometimes encountered include the doorways between cars, lack of handrails and stanchions, slippery floor surfaces, and the lack of public information in the dining car.

**Solution:** Bi-level dining cars shall have at least one connecting doorway at the end of the car which connects to the adjacent car. The doorway shall have a clear width of 32 in (815 mm). (Note: The 32 in (815 mm) doorway width to the bi-level dining car is for semi-ambulatory persons since wheelchair users cannot get to the upper level where entry is provided.) [38.113(a)(2)] Where provided, handrails and stanchions shall be sufficient to permit onboard circulation, seating and standing assistance for persons with disabilities. [38.115(b)] Floor surfaces on aisles, step treads and areas where wheelchairs and mobility aid users are to be accommodated shall be slip resistant. [38.117(a)] A public address system that permits transportation system personnel or recorded or digitized human speech messages to announce stations and provide other passenger information shall be available in the bi-level dining car. [38.121]

## ☐ **Bi-Level Lounge Cars**

**Problem:** Bi-level lounge cars are often difficult to access for individuals with disabilities because of the following barriers: Narrow entry doors, lack of seating for individuals with disabilities, or lack of space for a wheelchair, inability for an individual in a wheelchair to pull up to a table and stay in the wheelchair.

**Solution:** Bi-level lounge cars shall have doors on the lower level on each side of the car from which passengers board. Doorways shall have a clear width of 32 in (815 mm). [38.113] An accessible restroom complying with the design requirements of ADA Section 38.123 shall be provided. At least one space for persons who wish to remain in their wheelchairs shall be provided. The space shall have a clear floor area of 48 in (1220 mm) by 30 in (765 mm). Such space may have fold-down or removable seats for use when not occupied by a wheelchair. In addition, at least one dining booth or table seat shall be provided for individuals who wish to transfer from their wheelchairs. A space to fold or store the passenger's wheelchair shall also be provided. [38.125(d)(2) and (3)]

## ☐ **Sleeper Cars**

**Problem:** Sleeper cars on intercity rail trains are often difficult to access and use by individuals with disabilities. Some of the barriers encountered are the narrow doorways and passageways leading to the sleeping compartment and the layout of the sleeping compartment and access to restrooms.

**Solution:** Sleeper cars shall have at least one accessible sleeping compartment which complies with Section 38.127 of the ADA Standards (see Problem/Solution on Sleeping Compartments). The sleeper cars shall have an unobstructed passageway at least 32 in (815 mm) leading from the accessible door to the accessible sleeping compartment.

Problems and solutions related to specific design requirements address those barriers that disabled persons and persons in wheelchairs encounter from the time when they have boarded the vehicle and the doors have closed until they reach their intended station stop. These barriers are encountered as they move within the vehicle to get settled for the trip, as they move between vehicles and as they approach the various stops along their route.

#### Checklist of Problems - Specific Design Requirements

- ☐ Interior Circulation, Handrails and Stanchions
- ☐ Passageways
- ☐ Floors
- ☐ Thresholds
- ☐ Doorways Connecting Vehicles
- ☐ Public Information Systems
- ☐ Platform Signage
- ☐ Restrooms
- ☐ Sleeping Compartments

#### ☐ Interior Circulation, Handrails and Stanchions

**Problem:** On many intercity rail cars, the aisleways in the passenger compartment are narrow and there are no handrails or stanchions. Handrails and stanchions have been installed in some cars which makes it more difficult for persons using wheelchairs and mobility aids to get to the seating area.

**Solution:** When handrails or stanchions are provided on intercity rail cars within the passenger compartment, they shall be placed to permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a seating location from an accessible entrance. [38.115]

**Problem:** Some of the handrails are difficult to grasp. Some are square with sharp edges which seem to be dangerous if a person was to fall on them.

**Solution:** Handrails shall have a cross-sectional diameter between 1-1/4 in (32 mm) and 1-1/2 in (38 mm) or shall provide an equivalent grasping surface and have eased edges with corner radii of not less than 1/8 in (3 mm). Handrails shall be placed to provide a minimum 1-1/2 in (38 mm) knuckle clearance from the nearest adjacent surface. [38.115]

## ☐ **Passageways**

**Problem:** The passageways between the entrance door of intercity rail cars and the accessible seating locations and accessible sleeping compartments are sometimes too narrow for a wheelchair or mobility aid to use.

**Solution:** A route at least 32 in (815 mm) wide shall be provided from the accessible entrance door on the car to the accessible seating locations and accessible sleeping compartments.

If passage is required through a vestibule, such vestibule in new cars shall have a minimum width of 42 in (1070 mm). [38.113] If doors leading to the car from a platform close automatically or from a remote location, auditory and visual warning signals shall be provided to alert passengers of closing doors. [38.113(c)]

## ☐ **Floors**

**Problem:** Some floors become quite slippery when they are wet. Others are so smooth that even when they are dry, they are slippery. Are there standards which must be followed on rail vehicles which prescribe what type of material should be used on the floors?

**Solution:** Floor surfaces on aisles, places for standees, and areas where wheelchairs and mobility aid users are to be accommodated are to be slip resistant on all commuter rail cars. [38.117(a)]

**Problem:** The design of the new intercity rail cars calls for carpet on the floor. People who use wheelchairs and mobility aids could have a problem with a carpeted floor especially if the pile of the carpet is very thick. Are there standards that prohibit carpet?

**Solution:** The ADA Accessibility Specifications for Transportation Vehicles does not address carpeted floors. A guideline that could be used is Section 4.5.3 of the ADA Accessibility Guidelines for Buildings and Facilities which states: If a carpet or carpet tile is used on a ground or floor surface, then it shall be securely attached; have a firm cushion, pad, or backing or no cushion or pad; and have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum pile thickness shall be 1/2 in (13 mm). Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim up to 1/4 in (6 mm) high can be vertical. If the edge trim is between 1/4 in (6 mm) and 1/2 in (13 mm) a bevel with a slope no greater than 1:2 shall be used.

## ☐ Thresholds

**Problem:** It is difficult for people with vision impairments to see as they approach a threshold when moving about within or between intercity rail cars. Even though the threshold is beveled with a slope no greater than 1:2 as required by the ADAAG for Buildings and Facilities, it can still cause a tripping hazard for people with poor vision as they walk on the moving train.

**Solution:** All thresholds and step edges on intercity rail cars shall have a band of color(s) running the full width of the threshold which contrasts with the adjacent floor, either light-on-dark or dark-on-light. [38.117]

An appendix note recommends that the material used contrast by at least 70%. Percent contrast is determined by the following equation:

$$\text{Contrast} = \frac{B_1 - B_2}{B_1} \times 100$$

where  $B_1$  is the Light Reflectance Value of the lighter area and  $B_2$  is the Light Reflectance Value of the darker area. Note that in any application both white and black are never absolute: thus  $B_2$  never equals 100 and  $B_1$  is always greater than zero. [Appendix Part 38]

## ☐ Doorways Connecting Vehicles

**Problem:** If there is an emergency situation in one of the cars of a multi-car train, even though the aisle widths are wide enough for a wheelchair or a mobility aid to negotiate, once the person in the wheelchair reaches the door at the end of the car it is too narrow to allow passage.

**Solution:** Doorways at ends of new cars connecting two adjacent cars, to the maximum extent practicable in accordance with the regulations issued under the Federal Railroad Safety Act of 1970 (49 CFR Parts 229 and 231), shall have a clear opening width of 32 in (815 mm) to permit wheelchair and mobility aid users to enter into a single-level dining car, if available.

Note: The DOT rule requires an accessible car adjacent to a dining car whenever possible.

☐ **Public Information Systems**

**Problem:** When on the intercity rail car it is difficult for persons with disabilities to tell when they should start getting ready to exit the train. Also, even though many of the cars have internal speakers, these speakers cannot be heard by persons with hearing impairments.

**Solution:** Each car shall be equipped with an interior public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted. [38.121]

**Note:** Amtrak is experimenting with visual communication in cars.



## ☐ Platform Signage

**Problem:** When the train pulls into a station, it is difficult to see what station it is in because the station identification signs are too high. The only way to see them is to squat down and look up and out of the windows. Some stations don't have enough station identification signs so only every other car can see them.

**Solution:** New stations built after October 7, 1991, and key stations on intercity rail systems shall have identification signs complying with requirements for character proportion, height, finish and contrast of ADAAG for Buildings and Facilities. Signs shall be placed at frequent intervals and shall be clearly visible from within the car on both sides when not obstructed by another train. When station identification signs are placed close to vehicle windows (i.e., on the side opposite from boarding), each shall have the top of the highest letter or symbol below the top of the car window and the bottom of the lowest letter or symbol above the horizontal mid-line of the vehicle window. [10.3.1(5), 10.3.2(2)]

Station identification signs shall be designed to comply with the following signage standards.

**Character Proportion:** Letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10.

**Character Height:** Characters are numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case X. Lower case characters are permitted. If the sign is suspended above the finished floor, at least 80 in (2030 mm), complying with minimum headroom, the minimum character height shall be 3 in (75 mm).

**Finish and Contrast:** The characters and background of signs shall be eggshell, matte, or other non-glare finish. Characters and symbols shall contrast with their background - either light characters on a dark background or dark characters on a light background. [10.3.1(5), 10.3.2.(2), 4.30.1, 4.30.2, 4.30.3, 4.30.5]



## Restrooms

**Problem:** On the intercity rail car the path of travel to the restroom is restricted and the restroom layout is such that it is very difficult to use for persons in wheelchairs. Are restrooms required on commuter rail cars and if required, should they be made accessible to persons in wheelchairs and mobility aids?

**Solution:** If a restroom is provided for the general public, and an accessible restroom is required, it shall be designed so as to allow a person using a wheelchair or mobility aid to enter and use such a restroom as specified below.

Restrooms required to be accessible shall be in close proximity to at least one seating location for persons using mobility aids and shall be connected to such a space by an unobstructed path having a minimum width of 32 in (815 mm). [38.123(a)(b)]

**Problem:** The maneuvering space outside of the restroom on an intercity rail car is generally quite restricted. Because of this coupled with the layout inside of the restroom, sometimes a normal 32 in (815 mm) wide doorway is not wide enough.

**Solution:** Doorways on the end of the enclosure, opposite the water closet, shall have a minimum clear opening width of 32 in (815 mm). Doorways on the side wall shall have a minimum clear opening width of 39 in (990 mm). Door latches and hardware shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. [38.123(a)(5)]

**Problem:** The floor space inside most rail car restrooms is extremely restricted and there is not enough room to maneuver around to position the wheelchair. What is the minimum required clear floor area for a commuter rail car accessible restroom? Can any of the fixtures that hang from the wall share this space? Can fold-away fixtures be used that overlap the clear floor space?

**Solution:** The minimum clear floor area shall be 35 in (890 mm) by 60 in (1525 mm). Permanently installed fixtures may overlap this area a maximum of 6 in (150 mm), if the lowest portion of the fixture is a minimum of 9 in (230 mm) above the floor, and may overlap a maximum of 19 in (485 mm), if the lowest portion of the fixture is a minimum of 29 in (735 mm) above the floor, provided such fixtures do not interfere with access to the water closet. Fold-down or retractable seats or shelves may overlap the clear floor space at a lower height provided they can be easily folded up or moved out of the way. [38.123(a)(1)]

**Problem:** The height of an accessible water closet specified in ADAAG for Buildings and Facilities is 17 to 19 in (430 to 485 mm). Is this height the same for accessible built-in water closets like the type used in rail cars?

**Solution:** The height of the water closet shall be 17 in (430 mm) to 19 in (485 mm) measured to the top of the toilet seat. Seats shall not be sprung to return to a lifted position. [38.123(a)(2)]

**Problem:** In ADAAG for Buildings and Facilities, specific grab bars are required around the water closet area. Since water closets on rail cars are usually built in and the space is quite restricted, are grab bars required? If so, where should they be located and how long should they be?

**Solution:** A grab bar at least 24 in (610 mm) long shall be mounted behind the water closet, and a horizontal grab bar at least 40 in (1015 mm) shall be mounted on at least one side wall, with one end not more than 12 in (305 mm) from the back wall, at a height between 33 in (840 mm) and 36 in (915 mm) above the floor. [38.123(a)(3)]

**Problem:** Many times the faucets and flush controls are hard to reach and even if you can reach them, they are very difficult to operate.

**Solution:** Faucets and flush controls shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2N). Controls for flush valves shall be mounted no more than 44 in (1115 mm) above the floor. [38.123(a)(4)]

## ☐ **Sleeping Compartments**

**Problem:** Many times persons in wheelchairs and other mobility aids would like to ride the train across country. When looking into that possibility, not all intercity rail cars have accessible sleeping compartments. What are the design requirements for a sleeping compartment to be accessible?

**Solution:** Sleeping compartments required to be accessible shall be designed so as to allow a person using a wheelchair or mobility aid to enter, maneuver within and approach and use each element within such compartments.

Minimum door clear width leading into the sleeping compartment from an accessible vestibule shall be 32 in (815 mm). The accessible vestibule shall be 42 in (1065 mm) wide. Minimum maneuvering space for a wheelchair is a 60 in (1525 mm) diameter circle. If two hallways meet at a right angle, the minimum maneuvering space for a wheelchair to turn the corners requires each hallway to be 36 in (915 mm) wide. [38.127(a)]

**Problem:** Once settled in the sleeping compartment, it is difficult for a disabled person, especially a wheelchair user, to access the restroom.

**Solution:** Each accessible sleeping compartment shall contain an accessible restroom which can be entered directly from such a compartment. [38.127(b)]

**Problem:** Sometimes it is difficult to access the various controls, electrical plugs and switches in a confined space such as a rail car sleeping compartment, especially by persons in wheelchairs who have limited reach ranges.

**Solution:** Controls and operating mechanisms (e.g., heating and air conditioning controls, lighting controls, call buttons, electrical outlets, etc.) shall be mounted no more than 48 in (1220 mm) and no less than 15 in (380 mm) above the floor and shall have a clear floor area directly in front of a minimum of 30 in (765 mm) by 48 in (1220 mm). Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. [38.127(c)]

## 3B-18 Crosswalks and Crosswalk Lines

Crosswalk markings at signalized intersections and across intersectional approaches on which traffic stops, serve primarily to guide pedestrians in the proper paths. Crosswalk markings across roadways on which traffic is not controlled by traffic signals or STOP signs, must also serve to warn the motorist of a pedestrian crossing point. At non-intersectional locations, these markings legally establish the crosswalk.

Crosswalk lines shall be solid white lines, marking both edges of the crosswalk. They shall be not less than 6 inches in width and should not be spaced less than 6 feet apart. Under special circumstances where a stop line is not provided or where vehicular speeds exceed 35 MPH or where crosswalks are unexpected, it may be desirable to increase the width of the crosswalk line up to 24" in width. Crosswalk lines on both sides of the crosswalk should extend across the full width of pavement to discourage diagonal walking between crosswalks (fig. 3-14a).

Crosswalks should be marked at all intersections where there is substantial conflict between vehicle and pedestrian movements. Marked crosswalks should also be provided at other appropriate points of pedestrian concentration, such as at loading islands, midblock pedestrian crossing, or where pedestrians could not otherwise recognize the proper place to cross.

Crosswalk markings should not be used indiscriminately. An engineering study should be required before they are installed at locations away from traffic signals or STOP signs.

Since non-intersectional pedestrian crossings are generally unexpected by the motorist, warning signs (sec. 2C-31) should be installed and adequate visibility provided by parking prohibitions.

For added visibility, the area of the crosswalk may be marked with white diagonal lines at a 45° angle or with white longitudinal lines at a 90° angle to the line of the crosswalk (figs. 3-14b, 14c). These lines should be approximately 12" to 24" wide and spaced 12" to 24" apart. When diagonal or longitudinal lines are used to mark a crosswalk, the transverse crosswalk lines may be omitted. This type of marking is intended for use at locations where substantial numbers of pedestrians cross without any other traffic control device, at locations where physical conditions are such that added visibility of the crosswalk is desired or at places where a pedestrian crosswalk might not be expected. Care should be taken to insure that crosswalks with diagonal or longitudinal lines used at some locations do not weaken or detract from other crosswalks (where special emphasis markings are not used) (fig. 3-14a). When an exclusive pedestrian phase signal, which permits diagonal crossing, is installed at an intersection, a unique marking may be used for the crosswalk (fig. 3-15).

# **Federal Register**

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Friday  
September 6, 1991

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## **Part IV**

### **Department of Transportation**

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49 CFR Parts 27, 37 and 38  
Transportation for Individuals With  
Disabilities; Final Rule





transportation, Railroads,  
Transportation.

Issued this 22nd day of August, 1991, at  
Washington, DC.

Samuel K. Skinner,  
*Secretary of Transportation.*

For the reasons set forth in the  
preamble, the Department takes the  
following actions:

**PART 27—[AMENDED]**

1. The authority citation for title 49,  
part 27 Code of Federal Regulations, is  
revised to read as follows:

Authority: Sec. 504 of the Rehabilitation  
Act of 1973, as amended (29 U.S.C. 794); secs.  
16(a) and 16(d) of the Urban Mass  
Transportation Act of 1964, as amended (49  
U.S.C. 16(a) and 16(d); sec. 105(b) of the  
Federal-aid Highway Act of 1973 (49 U.S.C.  
142 nt.); the Americans with Disabilities Act  
of 1990 (42 U.S.C. 12101-12213; and 49 U.S.C.  
322.

2. Section 27.19 of 49 CFR part 27 is  
amended by revising paragraph (a) to  
read as follows:

**§ 27.19 Compliance with Americans with  
Disabilities Act requirements and UMTA  
policy.**

(a) Recipients subject to this part  
(whether public or private entities as  
defined in 49 CFR part 37) shall comply  
with all applicable requirements of the  
Americans with Disabilities Act (ADA)  
of 1990 (42 U.S.C. 12101-12213) including  
the Department's ADA regulations (49  
CFR parts 37 and 38), the regulations of  
the Department of Justice implementing  
Titles II and III of the ADA (28 CFR  
parts 35 and 36), and the regulations of  
the Equal Employment Opportunity  
Commission (EEOC) implementing title I  
of the ADA (29 CFR part 1630).

Compliance with the EEOC title I  
regulations is required as a condition of  
compliance with section 504 for DOT  
recipients even for organizations which,  
because they have fewer than 25 or 15  
employees, would not be subject to the  
EEOC regulation in its own right.  
Compliance with all these regulations is  
a condition of receiving Federal  
financial assistance from the  
Department of Transportation. Any  
recipient not in compliance with this  
requirement shall be subject to  
enforcement action under Subpart F of  
this part.

\* \* \*

**Subpart B (§§ 27.31-27.37) [Removed]**

**Subpart C (§§ 27.61-27.67) [Removed]**

**Subpart E (§§ 27.81-27.103) [Removed]**

**Appendix to Subpart E [Removed]**

**§ 27.73 [Removed]**

**Appendix A to Subpart D [Removed]**

3. Subparts B (§§ 27.31-27.37), C  
(§§ 27.61-27.67), E (§§ 27.81-27.103) and  
the Appendix to subpart E of 49 CFR  
part 27 are removed, and § 27.73 and  
Appendix A to Subpart D thereof are  
removed.

**Subpart F (§§ 27.121-27.129)  
[Redesignated as Subpart C]**

**Subpart D (§§ 27.71-27.75) [Redesignated  
as Subpart B]**

4. Subpart F (§§ 27.121-27.129) thereof  
is redesignated as new subpart C and  
subpart D (§§ 27.71 and 27.75) is  
redesignated as new subpart B.

5. The text of § 27.3 thereof is  
designated as paragraph (a) and a new  
paragraph (b) is added to § 27.3, to read  
as follows:

**§ 27.3 Applicability.**

(b) Design, construction, or alteration  
of buildings or other fixed facilities by  
public entities subject to part 37 of this  
title shall be in conformance with  
Appendix A to part 37 of this title. All  
other entities subject to section 504 shall  
design, construct or alter a building, or  
other fixed facilities shall be in  
conformance with either Appendix A to  
part 37 of this title or the Uniform  
Federal Accessibility Standards, 41 CFR  
part 101-19 subpart 101-19.6, appendix  
A.

6. Wherever a reference occurs to  
§ 27.67(d) in 49 CFR part 27, it is  
changed to § 27.3(b).

7. Removed from § 27.5 thereof are the  
definitions of "accessible," "closed  
station," "flag stop," "mass  
transportation," "mixed system," "open  
station," "passenger," and "urbanized  
area."

8. Section 27.67 is amended by  
removing paragraph (d), effective  
October 7, 1991.

9. Title 49, Code of Federal  
Regulations, part 37, is revised to read  
as follows:

**PART 37—TRANSPORTATION  
SERVICES FOR INDIVIDUALS WITH  
DISABILITIES (ADA)**

**Subpart A—General**

Sec.  
37.1 Purpose.  
37.3 Definitions.

**List of Subjects**

**49 CFR Part 27**

Administrative practice and  
procedure, Airports, Civil rights,  
Handicapped, Individuals with  
disabilities, Highways and roads,  
Reporting and recordkeeping  
requirements, Transportation.

**49 CFR Part 37**

Buildings, Buses, Civil rights,  
Handicapped, Individuals with  
disabilities, Mass transportation,  
Railroads, Reporting and recordkeeping  
requirements, Transportation.

**49 CFR Part 38**

Buses, Civil rights, Handicapped,  
Individuals with disabilities, Mass



- Sec.  
 37.5 Nondiscrimination.  
 37.7 Standards for accessible vehicles.  
 37.9 Standards for accessible transportation facilities.  
 37.11 Administrative enforcement.  
 37.13 Effective date for certain vehicle lift specifications.  
 37.15-37.19 [Reserved]

#### Subpart B—Applicability

- 37.21 Applicability: General.  
 37.23 Service under contract.  
 37.25 University transportation systems.  
 37.27 Transportation for elementary and secondary education systems.  
 37.29 Private entities providing taxi service.  
 37.31 Vanpools.  
 37.33 Airport transportation systems.  
 37.35 Supplemental service for other transportation modes.  
 37.37 Other applications.  
 37.39 [Reserved]

#### Subpart C—Transportation Facilities

- 37.41 Construction of transportation facilities by public entities.  
 37.43 Alteration of transportation facilities by public entities.  
 37.45 Construction and alteration of transportation facilities by private entities.  
 37.47 Key stations in light and rapid rail systems.  
 37.49 Designation of responsible person(s) for intercity and commuter rail stations.  
 37.51 Key stations in commuter rail systems.  
 37.53 Exception for New York and Philadelphia.  
 37.55 Intercity rail station accessibility.  
 37.57 Required cooperation.  
 37.59 Differences in accessibility completion dates.  
 37.61 Public transportation programs and activities in existing facilities.  
 37.63-37.69 [Reserved]

#### Subpart D—Acquisition of Accessible Vehicles by Public Entities

- 37.71 Purchase or lease of new non-rail vehicles by public entities operating fixed route systems.  
 37.73 Purchase or lease of used non-rail vehicles by public entities operating fixed route systems.  
 37.75 Remanufacture of non-rail vehicles and purchase or lease of remanufactured non-rail vehicles by public entities operating fixed route systems.  
 37.77 Purchase or lease of new non-rail vehicles by public entities operating demand responsive systems for the general public.  
 37.79 Purchase or lease of new rail vehicles by public entities operating rapid or light rail systems.  
 37.81 Purchase or lease of used rail vehicles by public entities operating rapid or light rail systems.  
 37.83 Remanufacture of rail vehicles and purchase or lease of remanufactured rail vehicles by public entities operating rapid or light rail systems.  
 37.85 Purchase or lease of new intercity and commuter rail cars.  
 37.87 Purchase or lease of used intercity and commuter rail cars.

- 37.89 Remanufacture of intercity and commuter rail cars and purchase or lease of remanufactured intercity and commuter rail cars.  
 37.91 Wheelchair locations and food service on intercity rail trains.  
 37.93 One car per train rule.  
 37.95 Ferries and other passenger vessels operated by public entities. [Reserved]  
 37.97-37.99 [Reserved]

#### Subpart E—Acquisition of Accessible Vehicles by Private Entities

- 37.101 Purchase or lease of vehicles by private entities not primarily engaged in the business of transporting people.  
 37.103 Purchase or lease of new non-rail vehicles by private entities primarily engaged in the business of transporting people.  
 37.105 Equivalent service standard.  
 37.107 Acquisition of passenger rail cars by private entities primarily engaged in the business of transporting people.  
 37.109 Ferries and other passenger vessels operated by private entities. [Reserved]  
 37.111-37.119 [Reserved]

#### Subpart F—Paratransit as a Complement to Fixed Route Service

- 37.121 Requirement for comparable complementary paratransit service.  
 37.123 ADA paratransit eligibility: Standards.  
 37.125 ADA paratransit eligibility: Process.  
 37.127 Complementary paratransit service for visitors.  
 37.129 Types of service.  
 37.131 Service criteria for complementary paratransit.  
 37.133 Subscription service.  
 37.135 Submission of paratransit plan.  
 37.137 Paratransit plan development.  
 37.139 Plan contents.  
 37.141 Requirements for a joint paratransit plan.  
 37.143 Paratransit plan implementation.  
 37.145 State comment on plans.  
 37.147 Considerations during UMTA review.  
 37.149 Disapproved plans.  
 37.151 Waiver for undue financial burden.  
 37.153 UMTA waiver determination.  
 37.155 Factors in decision to grant an undue financial burden waiver.  
 37.157-37.159 [Reserved]

#### Subpart G—Provision of Service

- 37.161 Maintenance of accessible features: General.  
 37.163 Keeping vehicle lifts in operative condition—public entities.  
 37.165 Lift and securement use.  
 37.167 Other service requirements.  
 37.169 Interim requirements for over-the-road bus service operated by private entities.  
 37.171 Equivalency requirement for demand responsive service operated by private entities not primarily engaged in the business of transporting people.  
 37.173 Training requirements.

#### Appendix A to part 37—Standards for Accessible Transportation Facilities

#### Appendix B to part 37—UMTA Regional Offices

#### Appendix C to part 37—Certifications

#### Appendix D to part 37—Construction and Interpretations of Provisions of 49 CFR part 37

Authority: Americans with Disabilities Act of 1990 (42 U.S.C. 12101-121213); 49 U.S.C. 322.

#### Subpart A—General

##### § 37.1 Purpose.

The purpose of this part is to implement the transportation and related provisions of titles II and III of the Americans with Disabilities Act of 1990.

##### § 37.3 Definitions.

As used in this part:

*Accessible* means, with respect to vehicles and facilities, complying with the accessibility requirements of parts 37 and 38 of this title.

*The Act or ADA* means the Americans with Disabilities Act of 1990 (Pub. L. 101-336, 104 Stat. 327, 42 U.S.C. 12101-12213 and 47 U.S.C. 225 and 611), as it may be amended from time to time.

*Administrator* means Administrator of the Urban Mass Transportation Administration, or his or her designee.

*Alteration* means a change to an existing facility, including, but not limited to, remodeling, renovation, rehabilitation, reconstruction, historic restoration, changes or rearrangement in structural parts or elements, and changes or rearrangement in the plan configuration of walls and full-height partitions. Normal maintenance, reroofing, painting or wallpapering, asbestos removal, or changes to mechanical or electrical systems are not alterations unless they affect the usability of the building or facility.

*Automated guideway transit system or AGT* means a fixed-guideway transit system which operates with automated (driverless) individual vehicles or multi-car trains. Service may be on a fixed schedule or in response to a passenger-activated call button.

*Auxiliary aids and services* includes:

(1) Qualified interpreters, notetakers, transcription services, written materials, telephone headset amplifiers, assistive listening devices, assistive listening systems, telephones compatible with hearing aids, closed caption decoders, closed and open captioning, text telephones (also known as telephone devices for the deaf, or TDDs), videotext displays, or other effective methods of making aurally delivered materials

available to individuals with hearing impairments;

(2) Qualified readers, taped texts, audio recordings, Brailled materials, large print materials, or other effective methods of making visually delivered materials available to individuals with visual impairments;

(3) Acquisition or modification of equipment or devices; or

(4) Other similar services or actions.

*Bus* means any of several types of self-propelled vehicles, generally rubber-tired, intended for use on city streets, highways, and busways, including but not limited to minibuses, forty- and thirty-foot buses, articulated buses, double-deck buses, and electrically powered trolley buses, used by public entities to provide designated public transportation service and by private entities to provide transportation service including, but not limited to, specified public transportation services. Self-propelled, rubber-tired vehicles designed to look like antique or vintage trolleys are considered buses.

*Commerce* means travel, trade, transportation, or communication among the several states, between any foreign country or any territory or possession and any state, or between points in the same state but through another state or foreign country.

*Commuter authority* means any state, local, regional authority, corporation, or other entity established for purposes of providing commuter rail transportation (including, but not necessarily limited to, the New York Metropolitan Transportation Authority, the Connecticut Department of Transportation, the Maryland Department of Transportation, the Southeastern Pennsylvania Transportation Authority, the New Jersey Transit Corporation, the Massachusetts Bay Transportation Authority, the Port Authority Trans-Hudson Corporation, and any successor agencies) and any entity created by one or more such agencies for the purposes of operating, or contracting for the operation of, commuter rail transportation.

*Commuter bus service* means fixed route bus service, characterized by service predominantly in one direction during peak periods, limited stops, use of multi-ride tickets, and routes of extended length, usually between the central business district and outlying suburbs. Commuter bus service may also include other service, characterized by a limited route structure, limited stops, and a coordinated relationship to another mode of transportation.

*Commuter rail car* means a rail passenger car obtained by a commuter

authority for use in commuter rail transportation.

*Commuter rail transportation* means short-haul rail passenger service operating in metropolitan and suburban areas, whether within or across the geographical boundaries of a state, usually characterized by reduced fare, multiple ride, and commutation tickets and by morning and evening peak period operations. This term does not include light or rapid rail transportation.

*Demand responsive system* means any system of transporting individuals, including the provision of designated public transportation service by public entities and the provision of transportation service by private entities, including but not limited to specified public transportation service, which is not a fixed route system.

*Designated public transportation* means transportation provided by a public entity (other than public school transportation) by bus, rail, or other conveyance (other than transportation by aircraft or intercity or commuter rail transportation) that provides the general public with general or special service, including charter service, on a regular and containing basis.

*Disability* means, with respect to an individual, a physical or mental impairment that substantially limits one or more of the major life activities of such individual; a record of such an impairment; or being regarded as having such an impairment.

(1) The phrase *physical or mental impairment* means—

(i) Any physiological disorder or condition, cosmetic disfigurement, or anatomical loss affecting one or more of the following body systems: neurological, musculoskeletal, special sense organs, respiratory including speech organs, cardiovascular, reproductive, digestive, genito-urinary, hemic and lymphatic, skin, and endocrine;

(ii) Any mental or psychological disorder, such as mental retardation, organic brain syndrome, emotional or mental illness, and specific learning disabilities;

(iii) The term *physical or mental impairment* includes, but is not limited to, such contagious or noncontagious diseases and conditions as orthopedic, visual, speech, and hearing impairments; cerebral palsy, epilepsy, muscular dystrophy, multiple sclerosis, cancer, heart disease, diabetes, mental retardation, emotional illness, specific learning disabilities, HIV disease, tuberculosis, drug addiction and alcoholism;

(iv) The phrase *physical or mental impairment* does not include homosexuality or bisexuality.

(2) The phrase *major life activities* means functions such as caring for one's self, performing manual tasks, walking, seeing, hearing, speaking, breathing, learning, and work.

(3) The phrase *has a record of such an impairment* means has a history of, or has been misclassified as having, a mental or physical impairment that substantially limits one or more major life activities.

(4) The phrase *is regarded as having such an impairment* means—

(i) Has a physical or mental impairment that does not substantially limit major life activities, but which is treated by a public or private entity as constituting such a limitation;

(ii) Has a physical or mental impairment that substantially limits a major life activity only as a result of the attitudes of others toward such an impairment; or

(iii) Has none of the impairments defined in paragraph (1) of this definition but is treated by a public or private entity as having such an impairment.

(5) The term *disability* does not include—

(i) Transvestism, transsexualism, pedophilia, exhibitionism, voyeurism, gender identity disorders not resulting from physical impairments, or other sexual behavior disorders;

(ii) Compulsive gambling, kleptomania, or pyromania;

(iii) Psychoactive substance abuse disorders resulting from the current illegal use of drugs.

*Facility* means all or any portion of buildings, structures, sites, complexes, equipment, roads, walks, passageways, parking lots, or other real or personal property, including the site where the building, property, structure, or equipment is located.

*Fixed route system* means a system of transporting individuals (other than by aircraft), including the provision of designated public transportation service by public entities and the provision of transportation service by private entities, including, but not limited to, specified public transportation service, on which a vehicle is operated along a prescribed route according to a fixed schedule.

*High speed rail* means a rail service having the characteristics of intercity rail service which operates primarily on a dedicated guideway or track not used, for the most part, by freight, including, but not limited to, trains on welded rail, magnetically levitated (maglev) vehicles

on a special guideway, or other advanced technology vehicles, designed to travel at speeds in excess of those possible on other types of railroads.

*Individual with a disability* means a person who has a disability, but does not include an individual who is currently engaging in the illegal use of drugs, when a public or private entity acts on the basis of such use.

*Intercity rail passenger car* means a rail car, intended for use by revenue passengers, obtained by the National Railroad Passenger Corporation (Amtrak) for use in intercity rail transportation.

*Intercity rail transportation* means transportation provided by Amtrak.

*Light rail* means a streetcar-type vehicle operated on city streets, semi-exclusive rights of way, or exclusive rights of way. Service may be provided by step-entry vehicles or by level boarding.

*New vehicle* means a vehicle which is offered for sale or lease after manufacture without any prior use.

*Operates* includes, with respect to a fixed route or demand responsive system, the provision of transportation service by a public or private entity itself or by a person under a contractual or other arrangement or relationship with the entity.

*Over-the-road bus* means a bus characterized by an elevated passenger deck located over a baggage compartment.

*Paratransit* means comparable transportation service required by the ADA for individuals with disabilities who are unable to use fixed route transportation systems.

*Private entity* means any entity other than a public entity.

*Public entity* means:

(1) Any state or local government;  
(2) Any department, agency, special purpose district, or other instrumentality of one or more state or local governments; and

(3) The National Railroad Passenger Corporation (Amtrak) and any commuter authority.

*Purchase or lease*, with respect to vehicles, means the time at which an entity is legally obligated to obtain the vehicles, such as the time of contract execution.

*Public school transportation* means transportation by schoolbus vehicles of schoolchildren, personnel, and equipment to and from a public elementary or secondary school and school-related activities.

*Rapid rail* means a subway-type transit vehicle railway operated on exclusive private rights of way with high level platform stations. Rapid rail also

may operate on elevated or at grade level track separated from other traffic.

*Remanufactured vehicle* means a vehicle which has been structurally restored and has had new or rebuilt major components installed to extend its service life.

*Secretary* means the Secretary of Transportation or his/her designee.

*Section 504* means section 504 of the Rehabilitation Act of 1973 (Pub. L. 93-112, 87 Stat. 394, 29 U.S.C. 794), as amended.

*Service animal* means any guide dog, signal dog, or other animal individually trained to work or perform tasks for an individual with a disability, including, but not limited to, guiding individuals with impaired vision, alerting individuals with impaired hearing to intruders or sounds, providing minimal protection or rescue work, pulling a wheelchair, or fetching dropped items.

*Salicitation* means the closing date for the submission of bids or offers in a procurement.

*Specified public transportation* means transportation by bus, rail, or any other conveyance (other than aircraft) provided by a private entity to the general public, with general or special service (including charter service) on a regular and continuing basis.

*Station* means, with respect to intercity and commuter rail transportation, the portion of a property located appurtenant to a right of way on which intercity or commuter rail transportation is operated, where such portion is used by the general public and is related to the provision of such transportation, including passenger platforms, designated waiting areas, restrooms, and, where a public entity providing rail transportation owns the property, concession areas, to the extent that such public entity exercises control over the selection, design, construction, or alteration of the property, but this term does not include flag stops (i.e., stations which are not regularly scheduled stops but at which trains will stop to board or detain passengers only on signal or advance notice).

*Transit facility* means, for purposes of determining the number of text telephones needed consistent with section 103.3.1(12) of appendix A to this part, a physical structure the primary function of which is to facilitate access to and from a transportation system which has scheduled stops at the structure. The term does not include an open structure or a physical structure the primary purpose of which is other than providing transportation services.

*UMT Act* means the Urban Mass Transportation Act of 1964, as amended (49 U.S.C. App. 1601 *et seq.*).

*Used vehicle* means a vehicle with prior use.

*Vanpool* means a voluntary commuter ridesharing arrangement, using vans with a seating capacity greater than 7 persons (including the driver) or buses, which provides transportation to a group of individuals traveling directly from their homes to their regular places of work within the same geographical area, and in which the commuter/driver does not receive compensation beyond reimbursement for his or her costs of providing the service.

*Vehicle*, as the term is applied to private entities, does not include a rail passenger car, railroad locomotive, railroad freight car, or railroad caboose, or other rail rolling stock described in section 242 of title III of the Act.

*Wheelchair* means a mobility aid belonging to any class of three or four-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered. A "common wheelchair" is such a device which does not exceed 30 inches in width and 48 inches in length measured two inches above the ground, and does not weigh more than 600 pounds when occupied.

### § 37.5 Nondiscrimination.

(a) No entity shall discriminate against an individual with a disability in connection with the provision of transportation service.

(b) Notwithstanding the provision of any special transportation service to individuals with disabilities, an entity shall not, on the basis of disability, deny to any individual with a disability the opportunity to use the entity's transportation service for the general public, if the individual is capable of using that service.

(c) An entity shall not require an individual with a disability to use designated priority seats, if the individual does not choose to use these seats.

(d) An entity shall not impose special charges, not authorized by this part, on individuals with disabilities, including individuals who use wheelchairs, for providing services required by this part or otherwise necessary to accommodate them.

(e) An entity shall not require that an individual with disabilities be accompanied by an attendant.

(f) Private entities that are primarily engaged in the business of transporting people and whose operations affect commerce shall not discriminate against any individual on the basis of disability in the full and equal enjoyment of



specified transportation services. This obligation includes, with respect to the provision of transportation services, compliance with the requirements of the rules of the Department of Justice concerning eligibility criteria, making reasonable modifications, providing auxiliary aids and services, and removing barriers (28 CFR 36.301—36.306).

(g) An entity shall not refuse to serve an individual with a disability or require anything contrary to this part because its insurance company conditions coverage or rates on the absence of individuals with disabilities or requirements contrary to this part.

(h) It is not discrimination under this part for an entity to refuse to provide service to an individual with disabilities because that individual engages in violent, seriously disruptive, or illegal conduct. However, an entity shall not refuse to provide service to an individual with disabilities solely because the individual's disability results in appearance or involuntary behavior that may offend, annoy, or inconvenience employees of the entity or other persons.

#### § 37.7 Standards for accessible vehicles.

(a) For purposes of this part, a vehicle shall be considered to be readily accessible to and usable by individuals with disabilities if it meets the requirements of this part and the standards set forth in part 38 of this title.

(b) For purposes of implementing the equivalent facilitation provision in § 38.2 of this title, a determination of compliance will be made by the Administrator or the Federal Railroad Administrator, as applicable, on a case-by-case basis. An entity wishing to employ equivalent facilitation in relation to a specification of part 38 of this title shall submit such a request to UMTA or FRA, as applicable, and include the following information:

- (1) Entity name, address, contact person, and telephone;
  - (2) Specific provision of part 38 of this title with which the entity is unable to comply;
  - (3) Reasons for inability to comply;
  - (4) Alternative method of compliance, with demonstration of how the alternative meets or exceeds the level of accessibility or usability of the vehicle provided in part 38 of this title; and
  - (5) Public participation used in developing alternative method of compliance and input from that participation.
- (c) Over-the-road buses acquired by public entities (or by a contractor to a public entity as provided in § 37.23 of

this part) shall comply with § 38.23 and subpart G of part 38 of this title.

#### § 37.9 Standards for accessible transportation facilities.

(a) For purposes of this part, a transportation facility shall be considered to be readily accessible to and usable by individuals with disabilities if it meets the requirements of this part and the standards set forth in appendix A to this part.

(b) Facility alterations begun before January 26, 1992, in a good faith effort to make a facility accessible to individuals with disabilities may be used to meet the key station requirements set forth in §§ 37.47 and 37.51 of this part, even if these alterations are not consistent with the standards set forth in appendix A to this part, if the modifications complied with the Uniform Federal Accessibility Standard (UFAS) (41 CFR part 101-19, subpart 101-19.6) or ANSI A117.1(1980) (American National Standards Specification for Making Buildings and Facilities Accessible to and Usable by, the Physically Handicapped). This paragraph applies only to alterations of individual elements and spaces and only to the extent that provisions covering those elements or spaces are contained in UFAS or ANSI A117.1, as applicable.

(c) Public entities shall ensure the construction of new bus stop pads are in compliance with section 10.2.1.(1) of appendix A to this part, to the extent construction specifications are within their control.

(d) For purposes of implementing the equivalent facilitation provision in section 2.2 of appendix A to this part, a determination of compliance will be made by the Administrator or the Federal Railroad Administrator, as applicable, on a case-by-case basis. An entity wishing to employ equivalent facilitation in relation to a specification of appendix A to this part shall submit such a request to UMTA or FRA, as applicable, and include the following information:

- (1) Entity name, address, contact person and telephone;
- (2) Specific provision of appendix A with which the entity is unable to comply;
- (3) Reasons for inability to comply;
- (4) Alternative method of compliance, with demonstration of how the alternative meets or exceeds the level of accessibility or usability of the facility provided in appendix A; and
- (5) Public participation used in developing alternative method of compliance and input from that participation.

#### § 37.11 Administrative enforcement.

(a) Recipients of Federal financial assistance from the Department of Transportation are subject to administrative enforcement of the requirements of this part under the provisions of 49 CFR part 27, subpart F.

(b) Public entities, whether or not they receive Federal financial assistance, also are subject to enforcement action as provided by the Department of Justice.

(c) Private entities, whether or not they receive Federal financial assistance, are also subject to enforcement action as provided in the regulations of the Department of Justice implementing title III of the ADA (28 CFR part 36).

#### § 37.13 Effective date for certain vehicle lift specifications.

The vehicle lift specifications identified in §§ 38.23(b)(6), 38.83(b)(6), 38.95(b)(6), and 38.125(b) of this title apply to solicitations for vehicles under this part after January 25, 1992.

#### §§ 37.15-37.19 [Reserved]

### Subpart B—Applicability

#### § 37.21 Applicability: General.

(a) This part applies to the following entities, whether or not they receive Federal financial assistance from the Department of Transportation:

- (1) Any public entity that provides designated public transportation or intercity or commuter rail transportation;
  - (2) Any private entity that provides specified public transportation; and
  - (3) Any private entity that is not primarily engaged in the business of transporting people but operates a demand responsive or fixed route system.
- (b) For entities receiving Federal financial assistance from the Department of Transportation, compliance with applicable requirements of this part is a condition of compliance with section 504 of the Rehabilitation Act of 1973 and of receiving financial assistance.
- (c) Entities to which this part applies also may be subject to ADA regulations of the Department of Justice (28 CFR parts 35 or 36, as applicable). The provisions of this part shall be interpreted in a manner that will make them consistent with applicable Department of Justice regulations. In any case of apparent inconsistency, the provisions of this part shall prevail.

**§ 37.23 Service under contract.**

(a) When a public entity enters into a contractual or other arrangement or relationship with a private entity to operate fixed route or demand responsive service, the public entity shall ensure that the private entity meets the requirements of this part that would apply to the public entity if the public entity itself provided the service.

(b) A private entity which purchases or leases new, used, or remanufactured vehicles, or remanufactures vehicles, for use, or in contemplation of use, in fixed route or demand responsive service under contract or other arrangement or relationship with a public entity, shall acquire accessible vehicles in all situations in which the public entity itself would be required to do so by this part.

(c) A public entity which enters into a contractual or other arrangement or relationship with a private entity to provide fixed route service shall ensure that the percentage of accessible vehicles operated by the public entity in its overall fixed route or demand responsive fleet is not diminished as a result.

(d) A private entity that provides fixed route or demand responsive transportation service under contract or other arrangement with another private entity shall be governed, for purposes of the transportation service involved, by the provisions of this part applicable to the other entity.

**§ 37.25 University transportation systems.**

(a) Transportation services operated by private institutions of higher education are subject to the provisions of this part governing private entities not primarily engaged in the business of transporting people.

(b) Transportation systems operated by public institutions of higher education are subject to the provisions of this part governing public entities. If a public institution of higher education operates a fixed route system, the requirements of this part governing commuter bus service apply to that system.

**§ 37.27 Transportation for elementary and secondary education systems.**

(a) The requirements of this part do not apply to public school transportation.

(b) The requirements of this part do not apply to the transportation of school children to and from a private elementary or secondary school, and its school-related activities, if the school is a recipient of Federal financial assistance, subject to the provisions of section 504 of the Rehabilitation Act of

1973, and is providing transportation service to students with disabilities equivalent to that provided to students without disabilities. The test of equivalence is the same as that provided in § 37.105. If the school does not meet the criteria of this paragraph for exemption from the requirements of this part, it is subject to the requirements of this part for private entities not primarily engaged in transporting people.

**§ 37.29 Private entities providing taxi service.**

(a) Providers of taxi service are subject to the requirements of this part for private entities primarily engaged in the business of transporting people which provide demand responsive service.

(b) Providers of taxi service are not required to purchase or lease accessible automobiles. When a provider of taxi service purchases or leases a vehicle other than an automobile, the vehicle is required to be accessible unless the provider demonstrates equivalency as provided in § 37.105 of this part. A provider of taxi service is not required to purchase vehicles other than automobiles in order to have a number of accessible vehicles in its fleet.

(c) Private entities providing taxi service shall not discriminate against individuals with disabilities by actions including, but not limited to, refusing to provide service to individuals with disabilities who can use taxi vehicles, refusing to assist with the stowing of mobility devices, and charging higher fares or fees for carrying individuals with disabilities and their equipment than are charged to other persons.

**§ 37.31 Vanpools.**

Vanpool systems which are operated by public entities, or in which public entities own or purchase or lease the vehicles, are subject to the requirements of this part for demand responsive service for the general public operated by public entities. A vanpool system in this category is deemed to be providing equivalent service to individuals with disabilities if a vehicle that an individual with disabilities can use is made available to and used by a vanpool in which such an individual chooses to participate.

**§ 37.33 Airport transportation systems.**

(a) Transportation systems operated by public airport operators, which provide designated public transportation and connect parking lots and terminals or provide transportation among terminals, are subject to the requirements of this part for fixed route

or demand responsive systems, as applicable, operated by public entities. Public airports which operate fixed route transportation systems are subject to the requirements of this part for commuter bus service operated by public entities. The provision by an airport of additional accommodations (e.g., parking spaces in a close-in lot) is not a substitute for meeting the requirements of this part.

(b) Fixed-route transportation systems operated by public airport operators between the airport and a limited number of destinations in the area it serves are subject to the provisions of this part for commuter bus systems operated by public entities.

(c) Private jitney or shuttle services that provide transportation between an airport and destinations in the area it serves in a route-deviation or other variable mode are subject to the requirements of this part for private entities primarily engaged in the business of transporting people which provide demand responsive service. They may meet equivalency requirements by such means as sharing or pooling accessible vehicles among operators, in a way that ensures the provision of equivalent service.

**§ 37.35 Supplemental service for other transportation modes.**

(a) Transportation service provided by bus or other vehicle by an intercity commuter or rail operator, as an extension of or supplement to its rail service, and which connects an intercity rail station and limited other points, is subject to the requirements of this part for fixed route commuter bus service operated by a public entity.

(b) Dedicated bus service to commuter rail systems, with through ticketing arrangements and which is available only to users of the commuter rail system, is subject to the requirements of this part for fixed route commuter bus service operated by a public entity.

**§ 37.37 Other applications.**

(a) A private entity does not become subject to the requirements of this part for public entities, because it receives an operating subsidy from, is regulated by, or is granted a franchise or permit to operate by a public entity.

(b) Shuttle systems and other transportation services operated by privately-owned hotels, car rental agencies, historical or theme parks, and other public accommodations are subject to the requirements of this part for private entities not primarily engaged in the business of transporting people. Either the requirements for

demand responsive or fixed route service may apply, depending upon the characteristics of each individual system of transportation.

(c) Conveyances used by members of the public primarily for recreational purposes rather than for transportation (e.g., amusement park rides, ski lifts, or historic rail cars or trolleys operated in museum settings) are not subject to the requirements of this part. Such conveyances are subject to Department of Justice regulations implementing title II or title III of the ADA (28 CFR part 35 or 36), as applicable.

(d) Transportation services provided by an employer solely for its own employees are not subject to the requirements of this part. Such services are subject to the regulations of the Equal Employment Opportunity Commission under title I of the ADA (29 CFR part 1630) and, with respect to public entities, the regulations of the Department of Justice under title II of the ADA (28 CFR part 35).

(e) Transportation systems operated by private clubs or establishments exempted from coverage under title II of the Civil Rights Act of 1964 (42 U.S.C. 2000a-(e)) or religious organizations or entities controlled by religious organizations are not subject to the requirements of this part.

(f) If a parent private company is not primarily engaged in the business of transporting people, or is not a place of public accommodation, but a subsidiary company or an operationally distinct segment of the company is primarily engaged in the business of transporting people, the transportation service provided by the subsidiary or segment is subject to the requirements of this part for private entities primarily engaged in the business of transporting people.

(g) High-speed rail systems operated by public entities are subject to the requirements of this part governing intercity rail systems.

(h) Private rail systems providing fixed route or specified public transportation service are subject to the requirements of § 37.107 with respect to the acquisition of rail passenger cars. Such systems are subject to the requirements of the regulations of the Department of Justice implementing title III of the ADA (28 CFR part 36) with respect to stations and other facilities.

#### § 37.39 [Reserved]

### Subpart C—Transportation Facilities

#### § 37.41 Construction of transportation facilities by public entities.

A public entity shall construct any new facility to be used in providing designated public transportation

services so that the facility is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs. This requirement also applies to the construction of a new station for use in intercity or commuter rail transportation. For purposes of this section, a facility or station is "new" if its construction begins (i.e., issuance of notice to proceed) after January 25, 1992, or, in the case of intercity or commuter rail stations, after October 7, 1991.

#### § 37.43 Alteration of transportation facilities by public entities.

(a) (1) When a public entity alters an existing facility or a part of an existing facility used in providing designated public transportation services in a way that affects or could affect the usability of the facility or part of the facility, the entity shall make the alterations (or ensure that the alterations are made) in such a manner, to the maximum extent feasible, that the altered portions of the facility are readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, upon the completion of such alterations.

(2) When a public entity undertakes an alteration that affects or could affect the usability of or access to an area of a facility containing a primary function, the entity shall make the alteration in such a manner that, to the maximum extent feasible, the path of travel to the altered area and the bathrooms, telephones, and drinking fountains serving the altered area are readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, upon completion of the alterations. *Provided*, that alterations to the path of travel, drinking fountains, telephones and bathrooms are not required to be made readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, if the cost and scope of doing so would be disproportionate.

(3) The requirements of this paragraph also apply to the alteration of existing intercity or commuter rail stations by the responsible person for, owner of, or person in control of the station.

(4) The requirements of this section apply to any alteration which begins (i.e., issuance of notice to proceed or work order, as applicable) after January 25, 1992, or, in the case of intercity and commuter rail stations, after October 7, 1991.

(b) As used in this section, the phrase *to the maximum extent feasible* applies to the occasional case where the nature of an existing facility makes it impossible to comply fully with

applicable accessibility standards through a planned alteration. In these circumstances, the entity shall provide the maximum physical accessibility feasible. Any altered features of the facility or portion of the facility that can be made accessible shall be made accessible. If providing accessibility to certain individuals with disabilities (e.g., those who use wheelchairs) would not be feasible, the facility shall be made accessible to individuals with other types of disabilities (e.g., those who use crutches, those who have impaired vision or hearing, or those who have other impairments).

(c) As used in this section, a *primary function* is a major activity for which the facility is intended. Areas of transportation facilities that involve primary functions include, but are not necessarily limited to, ticket purchase and collection areas, passenger waiting areas, train or bus platforms, baggage checking and return areas and employment areas (except those involving non-occupiable spaces accessed only by ladders, catwalks, crawl spaces, very narrow passageways, or freight (non-passenger) elevators which are frequented only by repair personnel).

(d) As used in this section, a "path of travel" includes a continuous, unobstructed way of pedestrian passage by means of which the altered area may be approached, entered, and exited, and which connects the altered area with an exterior approach (including sidewalks, parking areas, and streets), an entrance to the facility, and other parts of the facility. The term also includes the restrooms, telephones, and drinking fountains serving the altered area. An accessible path of travel may include walks and sidewalks, curb ramps and other interior or exterior pedestrian ramps, clear floor paths through corridors, waiting areas, concourses, and other improved areas, parking access aisles, elevators and lifts, bridges, tunnels, or other passageways between platforms, or a combination of these and other elements.

(e) (1) Alterations made to provide an accessible path of travel to the altered area will be deemed disproportionate to the overall alteration when the cost exceeds 20 percent of the cost of the alteration to the primary function area (without regard to the costs of accessibility modifications).

(2) Costs that may be counted as expenditures required to provide an accessible path of travel include:

(i) Costs associated with providing an accessible entrance and an accessible



route to the altered area (e.g., widening doorways and installing ramps);

(ii) Costs associated with making restrooms accessible (e.g., grab bars, enlarged toilet stalls, accessible faucet controls);

(iii) Costs associated with providing accessible telephones (e.g., relocation of phones to an accessible height, installation of amplification devices or TDDs);

(iv) Costs associated with relocating an inaccessible drinking fountain

(f) (1) When the cost of alterations necessary to make a path of travel to the altered area fully accessible is disproportionate to the cost of the overall alteration, then such areas shall be made accessible to the maximum extent without resulting in disproportionate costs;

(2) In this situation, the public entity should give priority to accessible elements that will provide the greatest access, in the following order:

(i) An accessible entrance;

(ii) An accessible route to the altered area;

(iii) At least one accessible restroom for each sex or a single unisex restroom (where there are one or more restrooms);

(iv) Accessible telephones;

(v) Accessible drinking fountains;

(vi) When possible, other accessible elements (e.g., parking, storage, alarms).

(g) If a public entity performs a series of small alterations to the area served by a single path of travel rather than making the alterations as part of a single undertaking, it shall nonetheless be responsible for providing an accessible path of travel.

(h)(1) If an area containing a primary function has been altered without providing an accessible path of travel to that area, and subsequent alterations of that area, or a different area on the same path of travel, are undertaken within three years of the original alteration, the total cost of alteration to the primary function areas on that path of travel during the preceding three year period shall be considered in determining whether the cost of making that path of travel is disproportionate;

(2) For the first three years after January 26, 1992, only alterations undertaken between that date and the date of the alteration at issue shall be considered in determining if the cost of providing accessible features is disproportionate to the overall cost of the alteration.

(3) Only alterations undertaken after January 26, 1992, shall be considered in determining if the cost of providing an accessible path of travel is

disproportionate to the overall cost of the alteration.

#### **§ 37.45 Construction and alteration of transportation facilities by private entities.**

In constructing and altering transit facilities, private entities shall comply with the regulations of the Department of Justice implementing Title III of the ADA (28 CFR part 36).

#### **§ 37.47 Key stations in light and rapid rail systems.**

(a) Each public entity that provides designated public transportation by means of a light or rapid rail system shall make key stations on its system readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs. This requirement is separate from and in addition to requirements set forth in § 37.43 of this part.

(b) Each public entity shall determine which stations on its system are key stations. The entity shall identify key stations, using the planning and public participation process set forth in paragraph (d) of this section, and taking into consideration the following criteria:

(1) Stations where passenger boardings exceed average station passenger boardings on the rail system by at least fifteen percent, unless such a station is close to another accessible station;

(2) Transfer stations on a rail line or between rail lines;

(3) Major interchange points with other transportation modes, including stations connecting with major parking facilities, bus terminals, intercity or commuter rail stations, passenger vessel terminals, or airports;

(4) End stations, unless an end station is close to another accessible station; and

(5) Stations serving major activity centers, such as employment or government centers, institutions of higher education, hospitals or other major health care facilities, or other facilities that are major trip generators for individuals with disabilities.

(c)(1) Unless the entity receives an extension under paragraph (c)(2) of this section, the public entity shall achieve accessibility of key stations as soon as practicable, but in no case later than July 26, 1993.

(2) The UMTA Administrator may grant an extension of this completion date for key station accessibility for a period up to July 26, 2020, provided that two-thirds of key stations are made accessible by July 26, 2010. Extensions may be granted as provided in paragraph (e) of this section.

(d) The public entity shall develop a plan for compliance for this section. The plan shall be submitted to the appropriate UMTA regional office by July 26, 1992. (See appendix B to this part for list.)

(1) The public entity shall consult with individuals with disabilities affected by the plan. The public entity also shall hold at least one public hearing on the plan and solicit comments on it. The plan submitted to UMTA shall document this public participation, including summaries of the consultation with individuals with disabilities and the comments received at the hearing and during the comment period. The plan also shall summarize the public entity's responses to the comments and consultation.

(2) The plan shall establish milestones for the achievement of required accessibility of key stations, consistent with the requirements of this section.

(e) A public entity wishing to apply for an extension of the July 26, 1993, deadline for key station accessibility shall include a request for an extension with its plan submitted to UMTA under paragraph (d) of this section. Extensions may be granted only with respect to key stations which need extraordinarily expensive structural changes to, or replacement of, existing facilities (e.g., installations of elevators, raising the entire passenger platform, or alterations of similar magnitude and cost). Requests for extensions shall provide for completion of key station accessibility within the time limits set forth in paragraph (c) of this section. The UMTA Administrator may approve, approve with conditions, modify, or disapprove any request for an extension.

#### **§ 37.49 Designation of responsible person(s) for intercity and commuter rail stations.**

(a) The responsible person(s) designated in accordance with this section shall bear the legal and financial responsibility for making a key station accessible in the same proportion as determined under this section.

(b) In the case of a station more than fifty percent of which is owned by a public entity, the public entity is the responsible party.

(c) In the case of a station more than fifty percent of which is owned by a private entity the persons providing commuter or intercity rail service to the station are the responsible parties, in a proportion equal to the percentage of all passenger boardings at the station attributable to the service of each, over the entire period during which the station is made accessible.

(d) In the case of a station of which no entity owns more than fifty percent, the owners of the station (other than private entity owners) and persons providing intercity or commuter rail service to the station are the responsible persons.

(1) Half the responsibility for the station shall be assumed by the owner(s) of the station. The owners shall share this responsibility in proportion to their ownership interest in the station, over the period during which the station is made accessible.

(2) The person(s) providing commuter or intercity rail service to the station shall assume the other half of the responsibility. These persons shall share this responsibility for the station in a proportion equal to the percentage of all passenger boardings at the station attributable to the service of each, over the period during which the station is made accessible.

(e) Persons who must share responsibility for station accessibility under paragraphs (c) and (d) of this section may, by agreement, allocate their responsibility in a manner different from that provided in this section.

#### **§ 37.51 Key stations in commuter rail systems.**

(a) The responsible person(s) shall make key stations on its system readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs. This requirement is separate from and in addition to requirements set forth in § 37.43 of this part.

(b) Each commuter authority shall determine which stations on its system are key stations. The commuter authority shall identify key stations, using the planning and public participation process set forth in paragraph (d) of this section, and taking into consideration the following criteria:

(1) Stations where passenger boardings exceed average station passenger boardings on the rail system by at least fifteen percent, unless such a station is close to another accessible station;

(2) Transfer stations on a rail line or between rail lines;

(3) Major interchange points with other transportation modes, including stations connecting with major parking facilities, bus terminals, intercity or commuter rail stations, passenger vessel terminals, or airports;

(4) End stations, unless an end station is close to another accessible station; and

(5) Stations serving major activity centers, such as employment or government centers, institutions of

higher education, hospitals or other major health care facilities, or other facilities that are major trip generators for individuals with disabilities.

(c)(1) Except as provided in this paragraph, the responsible person(s) shall achieve accessibility of key stations as soon as practicable, but in no case later than July 26, 1993.

(2) The UMTA Administrator may grant an extension of this deadline for key station accessibility for a period up to July 26, 2010. Extensions may be granted as provided in paragraph (e) of this section.

(d) The commuter authority and responsible person(s) for stations involved shall develop a plan for compliance for this section. This plan shall be completed and submitted to UMTA by July 26, 1992.

(1) The commuter authority and responsible person(s) shall consult with individuals with disabilities affected by the plan. The commuter authority and responsible person(s) also shall hold at least one public hearing on the plan and solicit comments on it. The plan shall document this public participation, including summaries of the consultation with individuals with disabilities and the comments received at the hearing and during the comment period. The plan also shall summarize the responsible person(s) responses to the comments and consultation.

(2) The plan shall establish milestones for the achievement of required accessibility of key stations, consistent with the requirements of this section.

(3) The commuter authority and responsible person(s) of each key station identified in the plan shall, by mutual agreement, designate a project manager for the purpose of undertaking the work of making the key station accessible.

(e) Any commuter authority and/or responsible person(s) wishing to apply for an extension of the July 26, 1993, deadline for key station accessibility shall include a request for extension with its plan submitted to under paragraph (d) of this section. Extensions may be granted only in a case where raising the entire passenger platform is the only means available of attaining accessibility or where other extraordinarily expensive structural changes (e.g., installations of elevators, or alterations of magnitude and cost similar to installing an elevator or raising the entire passenger platform) are necessary to attain accessibility. Requests for extensions shall provide for completion of key station

accessibility within the time limits set forth in paragraph (c) of this section. The UMTA Administrator may approve,

approve with conditions, modify, or disapprove any request for an extension.

#### **§ 37.53 Exception for New York and Philadelphia.**

(a) The following agreements entered into in New York, New York, and Philadelphia, Pennsylvania, contain lists of key stations for the public entities that are a party to those agreements for those service lines identified in the agreements. The identification of key stations under these agreements is deemed to be in compliance with the requirements of this Subpart.

(1) Settlement Agreement by and among Eastern Paralyzed Veterans Association, Inc., James J. Peters, Terrance Moakley, and Denise Figueroa, individually and as representatives of the class of all persons similarly situated (collectively, "the EPVA class representatives"); and Metropolitan Transportation Authority, New York City Transit Authority, and Manhattan and Bronx Surface Transit Operating Authority (October 4, 1984).

(2) Settlement Agreement by and between Eastern Paralyzed Veterans Association of Pennsylvania, Inc., and James J. Peters, individually; and Dudley R. Sykes, as Commissioner of the Philadelphia Department of Public Property, and his successors in office and the City of Philadelphia (collectively "the City") and Southeastern Pennsylvania Transportation Authority (June 28, 1989).

(b) To comply with §§ 37.47 (b) and (d) or 37.51 (b) and (d) of this part, the entities named in the agreements are required to use their public participation and planning processes only to develop and submit to the UMTA Administrator plans for timely completion of key station accessibility, as provided in this subpart.

(c) In making accessible the key stations identified under the agreements cited in this section, the entities named in the agreements are subject to the requirements of § 37.9 of this part.

#### **§ 37.55 Intercity rail station accessibility.**

All intercity rail stations shall be made readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, as soon as practicable, but in no event later than July 26, 2010. This requirement is separate from and in addition to requirements set forth in § 37.43 of this part.

#### **§ 37.57 Required cooperation.**

An owner or person in control of an intercity or commuter rail station shall provide reasonable cooperation to the



responsible person(s) for that station with respect to the efforts of the responsible person to comply with the requirements of this subpart.

**§ 37.59 Differences in accessibility completion dates.**

Where different completion dates for accessible stations are established under this part for a station or portions of a station (e.g., extensions of different periods of time for a station which serves both rapid and commuter rail systems), accessibility to the following elements of the station shall be achieved by the earlier of the completion dates involved:

- (a) Common elements of the station;
- (b) Portions of the facility directly serving the rail system with the earlier completion date; and
- (c) An accessible path from common elements of the station to portions of the facility directly serving the rail system with the earlier completion date.

**§ 37.61 Public transportation programs and activities in existing facilities.**

(a) A public entity shall operate a designated public transportation program or activity conducted in an existing facility so that, when viewed in its entirety, the program or activity is readily accessible to and usable by individuals with disabilities.

(b) This section does not require a public entity to make structural changes to existing facilities in order to make the facilities accessible by individuals who use wheelchairs, unless and to the extent required by § 37.43 (with respect to alterations) or §§ 37.47 or 37.51 of this part (with respect to key stations). Entities shall comply with other applicable accessibility requirements for such facilities.

(c) Public entities, with respect to facilities that, as provided in paragraph (b) of this section, are not required to be made accessible to individuals who use wheelchairs, are not required to provide to such individuals services made available to the general public at such facilities when the individuals could not utilize or benefit from the services.

**§§ 37.63–37.69 [Reserved]**

**Subpart D—Acquisition of Accessible Vehicles By Public Entities**

**§ 37.71 Purchase or lease of new non-rail vehicles by public entities operating fixed route systems.**

(a) Except as provided elsewhere in this section, each public entity operating a fixed route system making a solicitation after August 25, 1990, to purchase or lease a new bus or other new vehicle for use on the system, shall

ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

(b) A public entity may purchase or lease a new bus that is not readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, if it applies for, and the UMTA Administrator grants, a waiver as provided for in this section.

(c) Before submitting a request for such a waiver, the public entity shall hold at least one public hearing concerning the proposed request.

(d) The UMTA Administrator may grant a request for such a waiver if the public entity demonstrates to the UMTA Administrator's satisfaction that—

(1) The initial solicitation for new buses made by the public entity specified that all new buses were to be lift-equipped and were to be otherwise accessible to and usable by individuals with disabilities;

(2) Hydraulic, electromechanical, or other lifts for such new buses could not be provided by any qualified lift manufacturer to the manufacturer of such new buses in sufficient time to comply with the solicitation; and

(3) Any further delay in purchasing new buses equipped with such necessary lifts would significantly impair transportation services in the community served by the public entity.

(e) The public entity shall include with its waiver request a copy of the initial solicitation and written documentation from the bus manufacturer of its good faith efforts to obtain lifts in time to comply with the solicitation, and a full justification for the assertion that the delay in bus procurement needed to obtain a lift-equipped bus would significantly impair transportation services in the community. This documentation shall include a specific date at which the lifts could be supplied, copies of advertisements in trade publications and inquiries to trade associations seeking lifts, and documentation of the public hearing.

(f) Any waiver granted by the UMTA Administrator under this section shall be subject to the following conditions:

(1) The waiver shall apply only to the particular bus delivery to which the waiver request pertains;

(2) The waiver shall include a termination date, which will be based on information concerning when lifts will become available for installation on the new buses the public entity is purchasing. Buses delivered after this date, even though procured under a solicitation to which a waiver applied, shall be equipped with lifts;

(3) Any bus obtained subject to the waiver shall be capable of accepting a lift, and the public entity shall install a lift as soon as one becomes available;

(4) Such other terms and conditions as the UMTA Administrator may impose.

(g)(1) When the UMTA Administrator grants a waiver under this section, he/she shall promptly notify the appropriate committees of Congress.

(2) If the UMTA Administrator has reasonable cause to believe that a public entity fraudulently applied for a waiver under this section, the UMTA Administrator shall:

- (i) Cancel the waiver if it is still in effect; and
- (ii) Take other appropriate action.

**§ 37.73 Purchase or lease of used non-rail vehicles by public entities operating fixed route systems.**

(a) Except as provided elsewhere in this section, each public entity operating a fixed route system purchasing or leasing, after August 25, 1990, a used bus or other used vehicle for use on the system, shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

(b) A public entity may purchase or lease a used vehicle for use on its fixed route system that is not readily accessible to and usable by individuals with disabilities if, after making demonstrated good faith efforts to obtain an accessible vehicle, it is unable to do so.

(c) Good faith efforts shall include at least the following steps:

(1) An initial solicitation for used vehicles specifying that all used vehicles are to be lift-equipped and otherwise accessible to and usable by individuals with disabilities, or, if an initial solicitation is not used, a documented communication so stating;

(2) A nationwide search for accessible vehicles, involving specific inquiries to used vehicle dealers and other transit providers; and

(3) Advertising in trade publications and contacting trade associations.

(d) Each public entity purchasing or leasing used vehicles that are not readily accessible to and usable by individuals with disabilities shall retain documentation of the specific good faith efforts it made for three years from the date the vehicles were purchased. These records shall be made available, on request, to the UMTA Administrator and the public.

**§ 37.75 Remanufacture of non-rail vehicles and purchase or lease of remanufactured non-rail vehicles by public entities operating fixed route systems.**

(a) This section applies to any public entity operating a fixed route system which takes one of the following actions:

(1) After August 25, 1990, remanufactures a bus or other vehicle so as to extend its useful life for five years or more or makes a solicitation for such remanufacturing; or

(2) Purchases or leases a bus or other vehicle which has been remanufactured so as to extend its useful life for five years or more, where the purchase or lease occurs after August 25, 1990, and during the period in which the useful life of the vehicle is extended.

(b) Vehicles acquired through the actions listed in paragraph (a) of this section shall, to the maximum extent feasible, be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

(c) For purposes of this section, it shall be considered feasible to remanufacture a bus or other motor vehicle so as to be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless an engineering analysis demonstrates that including accessibility features required by this part would have a significant adverse effect on the structural integrity of the vehicle.

(d) If a public entity operates a fixed route system, any segment of which is included on the National Register of Historic Places, and if making a vehicle of historic character used solely on such segment readily accessible to and usable by individuals with disabilities would significantly alter the historic character of such vehicle, the public entity has only to make (or purchase or lease a remanufactured vehicle with) those modifications to make the vehicle accessible which do not alter the historic character of such vehicle, in consultation with the National Register of Historic Places.

(e) A public entity operating a fixed route system as described in paragraph (d) of this section may apply in writing to the UMTA Administrator for a determination of the historic character of the vehicle. The UMTA Administrator shall refer such requests to the National Register of Historic Places, and shall rely on its advice in making determinations of the historic character of the vehicle.

**§ 37.77 Purchase or lease of new non-rail vehicles by public entities operating a demand responsive system for the general public.**

(a) Except as provided in this section, a public entity operating a demand responsive system for the general public making a solicitation after August 25, 1990, to purchase or lease a new bus or other new vehicle for use on the system, shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

(b) If the system, when viewed in its entirety, provides a level of service to individuals with disabilities, including individuals who use wheelchairs, equivalent to the level of service it provides to individuals without disabilities, it may purchase new vehicles that are not readily accessible to and usable by individuals with disabilities.

(c) For purposes of this section, a demand responsive system, when viewed in its entirety, shall be deemed to provide equivalent service if the service available to individuals with disabilities, including individuals who use wheelchairs, is provided in the most integrated setting appropriate to the needs of the individual and is equivalent to the service provided other individuals with respect to the following service characteristics:

- (1) Response time;
- (2) Fares;
- (3) Geographic area of service;
- (4) Hours and days of service;
- (5) Restrictions or priorities based on trip purpose;
- (6) Availability of information and reservations capability; and
- (7) Any constraints on capacity or service availability.

(d) A public entity receiving UMTA funds under section 18 or a public entity in a small urbanized area which receives UMTA funds under Section 9 from a state administering agency rather than directly from UMTA, which determines that its service to individuals with disabilities is equivalent to that provided other persons shall, before any procurement of an inaccessible vehicle, file with the appropriate state program office a certificate that it provides equivalent service meeting the standards of paragraph (c) of this section. Public entities operating demand responsive service receiving funds under any other section of the UMT Act shall file the certificate with the appropriate UMTA regional office. A public entity which does not receive UMTA funds shall make such a certificate and retain it in its files, subject to inspection on request of

UMTA. All certificates under this paragraph may be made and filed in connection with a particular procurement or in advance of a procurement; however, no certificate shall be valid for more than one year. A copy of the required certificate is found in appendix C to this part.

(e) The waiver mechanism set forth in § 37.71(b)-(g) (unavailability of lifts) of this subpart shall also be available to public entities operating a demand responsive system for the general public.

**§ 37.79 Purchase or lease of new rail vehicles by public entities operating rapid or light rail systems.**

Each public entity operating a rapid or light rail system making a solicitation after August 25, 1990, to purchase or lease a new rapid or light rail vehicle for use on the system shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

**§ 37.81 Purchase or lease of used rail vehicles by public entities operating rapid or light rail systems.**

(a) Except as provided elsewhere in this section, each public entity operating a rapid or light rail system which, after August 25, 1990, purchases or leases a used rapid or light rail vehicle for use on the system shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

(b) A public entity may purchase or lease a used rapid or light rail vehicle for use on its rapid or light rail system that is not readily accessible to and usable by individuals if, after making demonstrated good faith efforts to obtain an accessible vehicle, it is unable to do so.

(c) Good faith efforts shall include at least the following steps:

(1) The initial solicitation for used vehicles made by the public entity specifying that all used vehicles were to be accessible to and usable by individuals with disabilities, or, if a solicitation is not used, a documented communication so stating;

(2) A nationwide search for accessible vehicles, involving specific inquiries to manufacturers and other transit providers; and

(3) Advertising in trade publications and contacting trade associations.

(d) Each public entity purchasing or leasing used rapid or light rail vehicles that are not readily accessible to and usable by individuals with disabilities shall retain documentation of the specific good faith efforts it made for three years from the date the vehicles

were purchased. These records shall be made available, on request, to the UMTA Administrator and the public.

**§ 37.83 Remanufacture of rail vehicles and purchase or lease of remanufactured rail vehicles by public entities operating rapid or light rail systems.**

(a) This section applies to any public entity operating a rapid or light rail system which takes one of the following actions:

(1) After August 25, 1990, remanufactures a light or rapid rail vehicle so as to extend its useful life for five years or more or makes a solicitation for such remanufacturing;

(2) Purchases or leases a light or rapid rail vehicle which has been remanufactured so as to extend its useful life for five years or more, where the purchase or lease occurs after August 25, 1990, and during the period in which the useful life of the vehicle is extended.

(b) Vehicles acquired through the actions listed in paragraph (a) of this section shall, to the maximum extent feasible, be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

(c) For purposes of this section, it shall be considered feasible to remanufacture a rapid or light rail vehicle so as to be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless an engineering analysis demonstrates that doing so would have a significant adverse effect on the structural integrity of the vehicle.

(d) If a public entity operates a rapid or light rail system any segment of which is included on the National Register of Historic Places and if making a rapid or light rail vehicle of historic character used solely on such segment readily accessible to and usable by individuals with disabilities would significantly alter the historic character of such vehicle, the public entity need only make (or purchase or lease a remanufactured vehicle with) those modifications that do not alter the historic character of such vehicle.

(e) A public entity operating a fixed route system as described in paragraph (d) of this section may apply in writing to the UMTA Administrator for a determination of the historic character of the vehicle. The UMTA Administrator shall refer such requests to the National Register of Historic Places and shall rely on its advice in making a determination of the historic character of the vehicle.

**§ 37.85 Purchase or lease of new intercity and commuter rail cars.**

Amtrak or a commuter authority making a solicitation after August 25, 1990, to purchase or lease a new intercity or commuter rail car for use on the system shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

**§ 37.87 Purchase or lease of used intercity and commuter rail cars.**

(a) Except as provided elsewhere in this section, Amtrak or a commuter authority purchasing or leasing a used intercity or commuter rail car after August 25, 1990, shall ensure that the car is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

(b) Amtrak or a commuter authority may purchase or lease a used intercity or commuter rail car that is not readily accessible to and usable by individuals if, after making demonstrated good faith efforts to obtain an accessible vehicle, it is unable to do so.

(c) Good faith efforts shall include at least the following steps:

(1) An initial solicitation for used vehicles specifying that all used vehicles accessible to and usable by individuals with disabilities;

(2) A nationwide search for accessible vehicles, involving specific inquiries to used vehicle dealers and other transit providers; and

(3) Advertising in trade publications and contacting trade associations.

(d) Amtrak and commuter authorities purchasing or leasing used intercity or commuter rail cars that are not readily accessible to and usable by individuals with disabilities shall retain documentation of the specific good faith efforts that were made for three years from the date the cars were purchased. These records shall be made available, to request, to the Federal Railroad Administration or UMTA Administrator, as applicable. These records shall be made available to the public, on request.

**§ 37.89 Remanufacture of intercity and commuter rail cars and purchase or lease of remanufactured intercity and commuter rail cars.**

(a) This section applies to Amtrak or a commuter authority which takes one of the following actions:

(1) Remanufactures an intercity or commuter rail car so as to extend its useful life for ten years or more;

(2) Purchases or leases an intercity or commuter rail car which has been remanufactured so as to extend its useful life for ten years or more.

(b) Intercity and commuter rail cars listed in paragraph (a) of this section shall, to the maximum extent feasible, be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

(c) For purposes of this section, it shall be considered feasible to remanufacture an intercity or commuter rail car so as to be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless an engineering analysis demonstrates that remanufacturing the car to be accessible would have a significant adverse effect on the structural integrity of the car.

**§ 37.91 Wheelchair locations and food service on intercity rail trains.**

(a) As soon as practicable, but in no event later than July 26, 1995, each person providing intercity rail service shall provide on each train a number of spaces—

(1) To park wheelchairs (to accommodate individuals who wish to remain in their wheelchairs) equal to not less than one half of the number of single level rail passenger coaches in the train; and

(2) To fold and store wheelchairs (to accommodate individuals who wish to transfer to coach seats) equal to not less than one half the number of single level rail passenger coaches in the train.

(b) As soon as practicable, but in no event later than July 26, 2000, each person providing intercity rail service shall provide on each train a number of spaces—

(1) To park wheelchairs (to accommodate individuals who wish to remain in their wheelchairs) equal to not less than the total number of single level rail passenger coaches in the train; and

(2) To fold and store wheelchairs (to accommodate individuals who wish to transfer to coach seats) equal to not less than the total number of single level rail passenger coaches in the train.

(c) In complying with paragraphs (a) and (b) of this section, a person providing intercity rail service may not provide more than two spaces to park wheelchairs nor more than two spaces to fold and store wheelchairs in any one coach or food service car.

(d) Unless not practicable, a person providing intercity rail transportation shall place an accessible car adjacent to the end of a single level dining car through which an individual who uses a wheelchair may enter.

(e) On any train in which either a single level or bi-level dining car is used to provide food service, a person providing intercity rail service shall



provide appropriate aids and services to ensure that equivalent food service is available to individuals with disabilities, including individuals who use wheelchairs, and to passengers traveling with such individuals. Appropriate auxiliary aids and services include providing a hard surface on which to eat.

(f) This section does not require the provision of securement devices on intercity rail cars.

**§ 37.93 One car per train rule.**

(a) The definition of accessible for purposes of meeting the one car per train rule is spelled out in the applicable subpart for each transportation system type in part 38 of this title.

(b) Each person providing intercity rail service and each commuter rail authority shall ensure that, as soon as practicable, but in no event later than July 26, 1995, that each train has one car that is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

(c) Each public entity providing light or rapid rail service shall ensure that each train, consisting of two or more vehicles, includes at least one car that is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, as soon as practicable but in no case later than July 25, 1995.

**§ 37.95 Ferries and other passenger vessels operated by public entities. [Reserved]**

**§§ 37.97-37.99 [Reserved]**

**Subpart E—Acquisition of Accessible Vehicles By Private Entities**

**§ 37.101 Purchase or lease of vehicles by private entities not primarily engaged in the business of transporting people.**

(a) *Application.* This section applies to all purchases or leases of vehicles by private entities which are not primarily engaged in the business of transporting people, in which a solicitation for the vehicle is made after August 25, 1990.

(b) *Fixed Route System. Vehicle Capacity Over 16.* If the entity operates a fixed route system and purchases or leases a vehicle with a seating capacity of over 16 passengers (including the driver) for use on the system, it shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

(c) *Fixed Route System. Vehicle Capacity of 16 or Fewer.* If the entity operates a fixed route system and purchases or leases a vehicle with a

seating capacity of 16 or fewer passengers (including the driver) for use on the system, it shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless the system, when viewed in its entirety, meets the standard for equivalent service of § 37.105 of this part.

(d) *Demand Responsive System. Vehicle Capacity Over 16.* If the entity operates a demand responsive system, and purchases or leases a vehicle with a seating capacity of over 16 passengers (including the driver) for use on the system, it shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless the system, when viewed in its entirety, meets the standard for equivalent service of § 37.105 of this part.

**§ 37.103 Purchase or lease of new non-rail vehicles by private entities primarily engaged in the business of transporting people.**

(a) *Application.* This section applies to all acquisitions of new vehicles by private entities which are primarily engaged in the business of transporting people and whose operations affect commerce, in which a solicitation for the vehicle is made (except as provided in paragraph (d) of this section) after August 25, 1990.

(b) *Fixed Route Systems.* If the entity operates a fixed route system, and purchases or leases a new vehicle other than an automobile, a van with a seating capacity of less than eight persons (including the driver), or an over-the-road bus, it shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

(c) *Demand Responsive Systems.* If the entity operates a demand responsive system, and purchases or leases a new vehicle other than an automobile, a van with a seating capacity of less than eight persons (including the driver), or an over-the-road bus, it shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless the system, when viewed in its entirety, meets the standard for equivalent service of § 37.105 of this part.

(d) *Vans with a Capacity of Fewer than 8 Persons.* If the entity operates either a fixed route or demand responsive system, and purchases or leases a new van with a seating capacity of fewer than eight persons including the driver (the solicitation for the vehicle being made after February

25, 1992), the entity shall ensure that the vehicle is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless the system, when viewed in its entirety, meets the standard for equivalent service of § 37.105 of this part.

**§ 37.105 Equivalent service standard.**

For purposes of §§ 37.101 and 37.103 of this part, a fixed route system or demand responsive system, when viewed in its entirety, shall be deemed to provide equivalent service if the service available to individuals with disabilities, including individuals who use wheelchairs, is provided in the most integrated setting appropriate to the needs of the individual and is equivalent to the service provided other individuals with respect to the following service characteristics:

(a) (1) Schedules/headways (if the system is fixed route);

(2) Response time (if the system is demand responsive);

(b) Fares;

(c) Geographic area of service;

(d) Hours and days of service;

(e) Availability of information;

(f) Reservations capability (if the system is demand responsive);

(g) Any constraints on capacity or service availability;

(h) Restrictions priorities based on trip purpose (if the system is demand responsive).

**§ 37.107 Acquisition of passenger rail cars by private entities primarily engaged in the business of transporting people.**

(a) A private entity which is primarily engaged in the business of transporting people and whose operations affect commerce, which makes a solicitation after February 25, 1992, to purchase or lease a new rail passenger car to be used in providing specified public transportation, shall ensure that the car is readily accessible to, and usable by, individuals with disabilities, including individuals who use wheelchairs. The accessibility standards in part 38 of this title which apply depend upon the type of service in which the car will be used.

(b) Except as provided in paragraph (c) of this section, a private entity which is primarily engaged in transporting people and whose operations affect commerce, which remanufactures a rail passenger car to be used in providing specified public transportation to extend its useful life for ten years or more, or purchases or leases such a remanufactured rail car, shall ensure that the rail car, to the maximum extent feasible, is made readily accessible to

and usable by individuals with disabilities, including individuals who use wheelchairs. For purposes of this paragraph, it shall be considered feasible to remanufacture a rail passenger car to be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless an engineering analysis demonstrates that doing so would have a significant adverse effect on the structural integrity of the car.

(c) Compliance with paragraph (b) of this section is not required to the extent that it would significantly alter the historic or antiquated character of a historic or antiquated rail passenger car, or a rail station served exclusively by such cars, or would result in the violation of any rule, regulation, standard or order issued by the Secretary under the Federal Railroad Safety Act of 1970. For purposes of this section, a historic or antiquated rail passenger car means a rail passenger car—

(1) Which is not less than 30 years old at the time of its use for transporting individuals;

(2) The manufacturer of which is no longer in the business of manufacturing rail passenger cars; and

(3) Which—

(i) Has a consequential association with events or persons significant to the past; or

(ii) Embodies, or is being restored to embody, the distinctive characteristics of a type of rail passenger car used in the past, or to represent a time period which has passed.

**§ 37.109 Ferries and other passenger vessels operated by private entities. (Reserved)**

**§ 37.111–37.119 (Reserved)**

#### **Subpart F—Paratransit as a Complement to Fixed Route Service**

##### **§ 37.121 Requirement for comparable complementary paratransit service.**

(a) Except as provided in paragraph (c) of this section, each public entity operating a fixed route system shall provide paratransit or other special service to individuals with disabilities that is comparable to the level of service provided to individuals without disabilities who use the fixed route system.

(b) To be deemed comparable to fixed route service, a complementary paratransit system shall meet the requirements of §§ 37.123–37.133 of this subpart. The requirement to comply with § 37.131 may be modified in accordance with the provisions of this subpart relating to undue financial burden.

(c) Requirements for complementary paratransit do not apply to commuter bus, commuter rail, or intercity rail systems.

##### **§ 37.123 ADA paratransit eligibility: Standards.**

(a) Public entities required by § 37.121 of this subpart to provide complementary paratransit service shall provide the service to the ADA paratransit eligible individuals described in paragraph (e) of this section.

(b) If an individual meets the eligibility criteria of this section with respect to some trips but not others, the individual shall be ADA paratransit eligible only for those trips for which he or she meets the criteria.

(c) Individuals may be ADA paratransit eligible on the basis of a permanent or temporary disability.

(d) Public entities may provide complementary paratransit service to persons other than ADA paratransit eligible individuals. However, only the cost of service to ADA paratransit eligible individuals may be considered in a public entity's request for an undue financial burden waiver under §§ 37.151–37.155 of this part.

(e) The following individuals are ADA paratransit eligible:

(1) Any individual with a disability who is unable, as the result of a physical or mental impairment (including a vision impairment), and without the assistance of another individual (except the operator of a wheelchair lift or other boarding assistance device), to board, ride, or disembark from any vehicle on the system which is readily accessible to and usable by individuals with disabilities.

(2) Any individual with a disability who needs the assistance of a wheelchair lift or other boarding assistance device and is able, with such assistance, to board, ride and disembark from any vehicle which is readily accessible to and usable by individuals with disabilities if the individual wants to travel on a route on the system during the hours of operation of the system at a time, or within a reasonable period of such time, when such a vehicle is not being used to provide designated public transportation on the route.

(i) An individual is eligible under this paragraph with respect to travel on an otherwise accessible route on which the boarding or disembarking location which the individual would use is one at which boarding or disembarking from the vehicle is precluded as provided in § 37.167(g) of this part.

(ii) An individual using a common wheelchair is eligible under this

paragraph if the individual's wheelchair cannot be accommodated on an existing vehicle (e.g., because the vehicle's lift does not meet the standards of part 38 of this title), even if that vehicle is accessible to other individuals with disabilities and their mobility wheelchairs.

(iii) With respect to rail systems, an individual is eligible under this paragraph if the individual could use an accessible rail system, but—

(A) there is not yet one accessible car per train on the system; or

(B) key stations have not yet been made accessible.

(3) Any individual with a disability who has a specific impairment-related condition which prevents such individual from traveling to a boarding location or from a disembarking location on such system.

(i) Only a specific impairment-related condition which prevents the individual from traveling to a boarding location or from a disembarking location is a basis for eligibility under this paragraph. A condition which makes traveling to boarding location or from a disembarking location more difficult for a person with a specific impairment-related condition than for an individual who does not have the condition, but does not prevent the travel, is not a basis for eligibility under this paragraph.

(ii) Architectural barriers not under the control of the public entity providing fixed route service and environmental barriers (e.g., distance, terrain, weather) do not, standing alone, form a basis for eligibility under this paragraph. The interaction of such barriers with an individual's specific impairment-related condition may form a basis for eligibility under this paragraph, if the effect is to prevent the individual from traveling to a boarding location or from a disembarking location.

(f) Individuals accompanying an ADA paratransit eligible individual shall be provided service as follows:

(1) One other individual accompanying the ADA paratransit eligible individual shall be provided service—

(i) If the ADA paratransit eligible individual is traveling with a personal care attendant, the entity shall provide service to one other individual in addition to the attendant who is accompanying the eligible individual;

(ii) A family member or friend is regarded as a person accompanying the eligible individual, and not as a personal care attendant, unless the family member or friend registered is acting in the capacity of a personal care attendant;

(2) Additional individuals accompanying the ADA paratransit eligible individual shall be provided service, provided that space is available for them on the paratransit vehicle carrying the ADA paratransit eligible individual and that transportation of the additional individuals will not result in a denial of service to ADA paratransit eligible individuals;

(3) In order to be considered as "accompanying" the eligible individual for purposes of this paragraph (f), the other individual(s) shall have the same origin and destination as the eligible individual.

**§ 37.125 ADA paratransit eligibility: Process.**

Each public entity required to provide complementary paratransit service by § 37.121 of this part shall establish a process for determining ADA paratransit eligibility.

(a) The process shall strictly limit ADA paratransit eligibility to individuals specified in § 37.123 of this part.

(b) All information about the process, materials necessary to apply for eligibility, and notices and determinations concerning eligibility shall be made available in accessible formats, upon request.

(c) If, by a date 21 days following the submission of a complete application, the entity has not made a determination of eligibility, the applicant shall be treated as eligible and provided service until and unless the entity denies the application.

(d) The entity's determination concerning eligibility shall be in writing. If the determination is that the individual is ineligible, the determination shall state the reasons for the finding.

(e) The public entity shall provide documentation to each eligible individual stating that he or she is "ADA Paratransit Eligible." The documentation shall include the name of the eligible individual, the name of the transit provider, the telephone number of the entity's paratransit coordinator, an expiration date for eligibility, and any conditions or limitations on the individual's eligibility including the use of a personal care attendant.

(f) The entity may require recertification of the eligibility of ADA paratransit eligible individuals at reasonable intervals.

(g) The entity shall establish an administrative appeal process through which individuals who are denied eligibility can obtain review of the denial.

(1) The entity may require that an appeal be filed within 60 days of the denial of an individual's application.

(2) The process shall include an opportunity to be heard and to present information and arguments, separation of functions (i.e., a decision by a person not involved with the initial decision to deny eligibility), and written notification of the decision, and the reasons for it.

(3) The entity is not required to provide paratransit service to the individual pending the determination on appeal. However, if the entity has not made a decision within 30 days of the completion of the appeal process, the entity shall provide paratransit service from that time until and unless a decision to deny the appeal is issued.

(h) The entity may establish an administrative process to suspend, for a reasonable period of time, the provision of complementary paratransit service to ADA eligible individuals who establish a pattern or practice of missing scheduled trips.

(1) Trips missed by the individual for reasons beyond his or her control (including, but not limited to, trips which are missed due to operator error) shall not be a basis for determining that such a pattern or practice exists.

(2) Before suspending service, the entity shall take the following steps:

(i) Notify the individual in writing that the entity proposes to suspend service, citing with specificity the basis of the proposed suspension and setting forth the proposed sanction.

(ii) Provide the individual an opportunity to be heard and to present information and arguments;

(iii) Provide the individual with written notification of the decision and the reasons for it.

(3) The appeals process of paragraph (g) of this section is available to an individual on whom sanctions have been imposed under this paragraph. The sanction is stayed pending the outcome of the appeal.

(i) In applications for ADA paratransit eligibility, the entity may require the applicant to indicate whether or not he or she travels with a personal care attendant.

**§ 37.127 Complementary paratransit service for visitors.**

(a) Each public entity required to provide complementary paratransit service under § 37.121 of this part shall make the service available to visitors as provided in this section.

(b) For purposes of this section, a visitor is an individual with disabilities who does not reside in the jurisdiction(s) served by the public entity or other entities with which the

public entity provides coordinated complementary paratransit service within a region.

(c) Each public entity shall treat as eligible for its complementary paratransit service all visitors who present documentation that they are ADA paratransit eligible, under the criteria of § 37.125 of this part, in the jurisdiction in which they reside.

(d) With respect to visitors with disabilities who do not present such documentation, the public entity may require the documentation of the individual's place of residence and, if the individual's disability is not apparent, of his or her disability. The entity shall provide paratransit service to individuals with disabilities who qualify as visitors under paragraph (b) of this section. The entity shall accept a certification by such individuals that they are unable to use fixed route transit.

(e) A public entity is not required to provide service to a visitor for more than 21 days from the date of the first paratransit trip used by the visitor. The entity may require that such an individual, in order to receive service beyond this period, apply for eligibility under the process provided for in § 37.125 of this part.

**§ 37.129 Types of service.**

(a) Except as provided in this section, complementary paratransit service for ADA paratransit eligible persons shall be origin-to-destination service.

(b) Complementary paratransit service for ADA paratransit eligible persons described in § 37.123(e)(2) of this part may also be provided by on-call bus service or paratransit feeder service to an accessible fixed route, where such service enables the individual to use the fixed route bus system for his or her trip.

(c) Complementary paratransit service for ADA eligible persons described in § 37.123(e)(3) of this part also may be provided by paratransit feeder service to and/or from an accessible fixed route.

**§ 37.131 Service criteria for complementary paratransit.**

The following service criteria apply to complementary paratransit required by § 37.121 of this part.

(a) *Service Area*—(1) *Bus*. (i) The entity shall provide complementary paratransit service to origins and destinations within corridors with a width of three-fourths of a mile on each side of each fixed route. The corridor shall include an area with a three-



fourths of a mile radius at the ends of each fixed route.

(ii) Within the core service area, the entity also shall provide service to small areas not inside any of the corridors but which are surrounded by corridors.

(iii) Outside the core service area, the entity may designate corridors with widths from three fourths of a mile up to one and one half miles on each side of a fixed route, based on local circumstances.

(iv) For purposes of this paragraph, the core service area is that area in which corridors with a width of three-fourths of a mile on each side of each fixed route merge together such that, with few and small exceptions, all origins and destinations within the area would be served.

(2) *Rail.* (i) For rail systems, the service area shall consist of a circle with a radius of  $\frac{3}{4}$  of a mile around each station.

(ii) At end stations and other stations in outlying areas, the entity may designate circles with radii of up to  $\frac{1}{2}$  miles as part of its service area, based on local circumstances.

(3) *Jurisdictional Boundaries.* Notwithstanding any other provision of this paragraph, an entity is not required to provide paratransit service in an area outside the boundaries of the jurisdiction(s) in which it operates, if the entity does not have legal authority to operate in that area. The entity shall take all practicable steps to provide paratransit service to any part of its service area.

(b) *Response Time.* The entity shall schedule and provide paratransit service to any ADA paratransit eligible person at any requested time on a particular day in response to a request for service made the previous day. Reservations may be taken by reservation agents or by mechanical means.

(1) The entity shall make reservation service available during at least all normal business hours of the entity's administrative offices, as well as during times, comparable to normal business hours, on a day when the entity's offices are not open before a service day.

(2) The entity may negotiate pickup times with the individual, but the entity shall not require an ADA paratransit eligible individual to schedule a trip to begin more than one hour before or after the individual's desired departure time.

(3) The entity may use real-time scheduling in providing complementary paratransit service.

(4) The entity shall permit advance reservations to be made up to 14 days in advance of an ADA paratransit eligible individual's desired trip.

(c) *Fares.* The fare for a trip charged to an ADA paratransit eligible user of the complementary paratransit service shall not exceed twice the fare that would be charged to an individual paying full fare (i.e., without regard to discounts) for a trip of similar length, at a similar time of day, on the entity's fixed route system.

(1) In calculating the full fare that would be paid by an individual using the fixed route system, the entity may include transfer and premium charges applicable to a trip of similar length, at a similar time of day, on the fixed route system.

(2) The fares for individuals accompanying ADA paratransit eligible individuals, who are provided service under § 37.123 (f) of this part, shall be the same as for the ADA paratransit eligible individuals they are accompanying.

(3) A personal care attendant shall not be charged for complementary paratransit service.

(4) The entity may charge a fare higher than otherwise permitted by this paragraph to a social service agency or other organization for agency trips (i.e., trips guaranteed to the organization).

(d) *Trip Purpose Restrictions.* The entity shall not impose restrictions or priorities based on trip purpose.

(e) *Hours and Days of Service.* The complementary paratransit service shall be available throughout the same hours and days as the entity's fixed route service.

(f) *Capacity Constraints.* The entity shall not limit the availability of complementary paratransit service to ADA paratransit eligible individuals by any of the following:

(1) Restrictions on the number of trips an individual will be provided;

(2) Waiting lists for access to the service; or

(3) Any operational pattern or practice that significantly limits the availability of service to ADA paratransit eligible persons.

(i) Such patterns or practices include, but are not limited to, the following:

(A) Substantial numbers of significantly untimely pickups for initial or return trips;

(B) Substantial numbers of trip denials or missed trips;

(C) Substantial numbers of trips with excessive trip lengths.

(ii) Operational problems attributable to causes beyond the control of the entity (including, but not limited to, weather or traffic conditions affecting all vehicular traffic that were not anticipated at the time a trip was scheduled) shall not be a basis for

determining that such a pattern or practice exists.

(g) *Additional Service.* Public entities may provide complementary paratransit service to ADA paratransit eligible individuals exceeding that provided for in this section. However, only the cost of service provided for in this section may be considered in a public entity's request for an undue financial burden waiver under §§ 37.151–37.155 of this part.

#### § 37.133 Subscription service.

(a) This part does not prohibit the use of subscription service by public entities as part of a complementary paratransit system, subject to the limitations in this section.

(b) Subscription service may not absorb more than fifty percent of the number of trips available at a given time of day, unless there is non-subscription capacity.

(c) Notwithstanding any other provision of this part, the entity may establish waiting lists or other capacity constraints and trip purpose restrictions or priorities for participation in the subscription service only.

#### § 37.135 Submission of paratransit plan.

(a) *General.* Each public entity operating fixed route transportation service, which is required by § 37.121 to provide complementary paratransit service, shall develop a paratransit plan.

(b) *Initial Submission.* Except as provided in § 37.141 of this part, each entity shall submit its initial plan for compliance with the complementary paratransit service provision by January 26, 1992, to the appropriate location identified in paragraph (f) of this section.

(c) *Annual Updates.* Each entity shall submit an annual update to the plan on January 26 of each succeeding year.

(d) *Phase-in of Implementation.* Each plan shall provide full compliance by no later than January 26, 1997, unless the entity has received a waiver based on undue financial burden. If the date for full compliance specified in the plan is after January 26, 1993, the plan shall include milestones, providing for measured, proportional progress toward full compliance.

(e) *Plan Implementation.* Each entity shall begin implementation of its plan on January 26, 1992.

(f) *Submission Locations.* An entity shall submit its plan to one of the following offices, as appropriate:

(1) The individual state administrative agency, if it is—

(i) A section 18 recipient;

(ii) A small urbanized area recipient of section 9 funds administered by the State;

(iii) A participant in a coordinated plan, in which all of the participating entities are eligible to submit their plans to the State; or

(2) The UMTA Regional Office (as listed in Appendix B to this part) for all other entities required to submit a paratransit plan. This includes an UMTA recipient under section 9 of the UMT Act; entities submitting a joint plan (unless they meet the requirements of paragraph (f)(1)(iii) of this section), and a public entity not an UMT Act recipient.

#### § 37.137 Paratransit plan development.

(a) *Survey of existing services.* Each submitting entity shall survey the area to be covered by the plan to identify any person or entity (public or private) which provides a paratransit or other special transportation service for ADA paratransit eligible individuals in the service area to which the plan applies.

(b) *Public participation.* Each submitting entity shall ensure public participation in the development of its paratransit plan, including at least the following:

(1) *Outreach.* Each submitting entity shall solicit participation in the development of its plan by the widest range of persons anticipated to use its paratransit service. Each entity shall develop contacts, mailing lists and other appropriate means for notification of opportunities to participate in the development of the paratransit plan;

(2) *Consultation with individuals with disabilities.* Each entity shall contact individuals with disabilities and groups representing them in the community. Consultation shall begin at an early stage in the plan development and should involve persons with disabilities in all phases of plan development. All documents and other information concerning the planning procedure and the provision of service shall be available, upon request, to members of the public, except where disclosure would be an unwarranted invasion of personal privacy;

(3) *Opportunity for public comment.* The submitting entity shall make its plan available for review before the plan is finalized. In making the plan available for public review, the entity shall ensure that the plan is available upon request in accessible formats;

(4) *Public hearing.* The entity shall sponsor at a minimum one public hearing and shall provide adequate notice of the hearing, including advertisement in appropriate media, such as newspapers of general and

special interest circulation and radio announcements; and

(5) *Special requirements.* If the entity intends to phase-in its paratransit service over a multi-year period, or request a waiver based on undue financial burden, the public hearing shall afford the opportunity for interested citizens to express their views concerning the phase-in, the request, and which service criteria may be delayed in implementation.

(c) *Ongoing requirement.* The entity shall create an ongoing mechanism for the participation of individuals with disabilities in the continued development and assessment of services to persons with disabilities. This includes, but is not limited to, the development of the initial plan, any request for an undue financial burden waiver, and each annual submission.

#### § 37.139 Plan contents.

Each plan shall contain the following information:

(a) Identification of the entity or entities submitting the plan, specifying for each—

(1) Name and address; and

(2) Contact person for the plan, with telephone number and facsimile telephone number (FAX), if applicable.

(b) A description of the fixed route system as of January 26, 1992 (or subsequent year for annual updates), including—

(1) A description of the service area, route structure, days and hours of service, fare structure, and population served. This includes maps and tables, if appropriate;

(2) The total number of vehicles (bus, van, or rail) operated in fixed route service (including contracted service), and percentage of accessible vehicles and percentage of routes accessible to and usable by persons with disabilities, including persons who use wheelchairs;

(3) Any other information about the fixed route service that is relevant to establishing the basis for comparability of fixed route and paratransit service.

(c) A description of existing paratransit services, including:

(1) An inventory of service provided by the public entity submitting the plan;

(2) An inventory of service provided by other agencies or organizations, which may in whole or in part be used to meet the requirement for complementary paratransit service; and

(3) A description of the available paratransit services in paragraphs (c)(2) and (c)(3) of this section as they relate to the service criteria described in § 37.131 of this part of service area, response time, fares, restrictions on trip purpose, hours and days of service, and

capacity constraints; and to the requirements of ADA paratransit eligibility.

(d) A description of the plan to provide comparable paratransit, including:

(1) An estimate of demand for comparable paratransit service by ADA eligible individuals and a brief description of the demand estimation methodology used;

(2) An analysis of differences between the paratransit service currently provided and what is required under this part by the entity(ies) submitting the plan and other entities, as described in paragraph (c) of this section;

(3) A brief description of planned modifications to existing paratransit and fixed route service and the new paratransit service planned to comply with the ADA paratransit service criteria;

(4) A description of the planned comparable paratransit service as it relates to each of the service criteria described in § 37.131 of this part—service area, absence of restrictions or priorities based on trip purpose, response time, fares, hours and days of service, and lack of capacity constraints. If the paratransit plan is to be phased in, this paragraph shall be coordinated with the information being provided in paragraphs (d)(5) and (d)(6) of this paragraph;

(5) A timetable for implementing comparable paratransit service, with a specific date indicating when the planned service will be completely operational. In no case may full implementation be completed later than January 26, 1997. The plan shall include milestones for implementing phases of the plan, with progress that can be objectively measured yearly;

(6) A budget for comparable paratransit service, including capital and operating expenditures over five years.

(e) A description of the process used to certify individuals with disabilities as ADA paratransit eligible. At a minimum, this must include—

(1) A description of the application and certification process, including—

(i) The availability of information about the process and application materials inaccessible formats;

(ii) The process for determining eligibility according to the provisions of §§ 37.123–37.125 of this part and notifying individuals of the determination made;

(iii) The entity's system and timetable for processing applications and allowing presumptive eligibility; and



(iv) The documentation given to eligible individuals.

(2) A description of the administrative appeals process for individuals denied eligibility.

(3) A policy for visitors, consistent with § 37.127 of this part.

(f) Description of the public participation process including—

(1) Notice given of opportunity for public comment, the date(s) of completed public hearing(s), availability of the plan in accessible formats, outreach efforts, and consultation with persons with disabilities.

(2) A summary of significant issues raised during the public comment period, along with a response to significant comments and discussion of how the issues were resolved.

(g) Efforts to coordinate service with other entities subject to the complementary paratransit requirements of this part which have overlapping or contiguous service areas or jurisdictions.

(h) The following endorsements or certifications:

(1) A resolution adopted by the board of the entity authorizing the plan, as submitted. If more than one entity is submitting the plan there must be an authorizing resolution from each board. If the entity does not function with a board, a statement shall be submitted by the entity's chief executive;

(2) In urbanized areas, certification by the Metropolitan Planning Organization (MPO) that it has reviewed the plan and that the plan is in conformance with the transportation plan developed under the Urban Mass Transportation/Federal Highway Administration joint planning regulation (49 CFR part 613 and 23 CFR part 450). In a service area which is covered by more than one MPO, each applicable MPO shall certify conformity of the entity's plan. The provisions of this paragraph do not apply to non-UMTA recipients;

(3) A certification that the survey of existing paratransit service was conducted as required in § 37.137(a) of this part;

(4) To the extent service provided by other entities is included in the entity's plan for comparable paratransit service, the entity must certify that:

(i) ADA paratransit eligible individuals have access to the service;

(ii) The service is provided in the manner represented; and

(iii) Efforts will be made to coordinate the provision of paratransit service by other providers.

(i) A request for a waiver based on undue financial burden, if applicable. The waiver request should include information sufficient for UMTA to

consider the factors in § 37.155 of this part. If a request for an undue financial burden waiver is made, the plan must include a description of additional paratransit services that would be provided to achieve full compliance with the requirement for comparable paratransit in the event the waiver is not granted, and the timetable for the implementation of these additional services.

(j) *Annual plan updates.* (1) The annual plan updates submitted January 26, 1993, and annually thereafter, shall include information necessary to update the information requirements of this section. Information submitted annually must include all significant changes and revisions to the timetable for implementation;

(2) If the paratransit service is being phased in over more than one year, the entity must demonstrate that the milestones identified in the current paratransit plans have been achieved. If the milestones have not been achieved, the plan must explain any slippage and what actions are being taken to compensate for the slippage.

(3) The annual plan must describe specifically the means used to comply with the public participation requirements, as described in § 37.137 of this part.

#### § 37.141 Requirements for a joint paratransit plan.

(a) Two or more entities with overlapping or contiguous service areas or jurisdictions may develop and submit a joint plan providing for coordinated paratransit service. Joint plans shall identify the participating entities and indicate their commitment to participate in the plan.

(b) To the maximum extent feasible, all elements of the coordinated plan shall be submitted on January 26, 1992. If a coordinated plan is not completed by January 26, 1992, those entities intending to coordinate paratransit service must submit a general statement declaring their intention to provide coordinated service and each element of the plan specified in § 37.139 to the extent practicable. In addition, the plan must include the following certifications from each entity involved in the coordination effort:

(1) A certification that the entity is committed to providing ADA paratransit service as part of a coordinated plan.

(2) A certification from each public entity participating in the plan that it will maintain current levels of paratransit service until the coordinated plan goes into effect.

(c) Entities submitting the above certifications and plan elements in lieu

of a completed plan on January 26, 1992 must submit a complete plan by July 2, 1992.

(d) Filing of an individual plan does not preclude an entity from cooperating with other entities in the development/implementation of a joint plan. An entity wishing to join with other entities after its initial submission may do so by meeting the filing requirements of this section.

#### § 37.143 Paratransit plan implementation.

(a) Each entity shall begin implementation of its complementary paratransit plan, pending notice from UMTA. The implementation of the plan shall be consistent with the terms of the plan, including any specified phase-in period.

(b) If the plan contains a request for waiver based on undue financial burden, the entity shall begin implementation of its plan, pending a determination on its waiver request.

#### § 37.145 State comment on plans.

Each state required to receive plans under § 37.135 of this part shall:

(a) Ensure that all applicable section 18 and section 9 recipients have submitted plans.

(b) Certify to UMTA that all plans have been received.

(c) Forward the required certification with comments on each plan to UMTA. The plans, with comments, shall be submitted to UMTA no later than April 1, 1992, for the first year and April 1 annually thereafter.

(d) The State shall develop comment on each plan, responding to the following points:

(1) Was the plan filed on time?

(2) Does the plan appear reasonable?

(3) Are there circumstances that bear on the ability of the grantee to carry out the plan as represented? If yes, please elaborate.

(4) Is the plan consistent with statewide planning activities?

(5) Are the necessary anticipated financial and capital resources identified in the plan accurately estimated?

#### § 37.147 Considerations during UMTA review.

In reviewing each plan, at a minimum UMTA will consider the following:

(a) Whether the plan was filed on time;

(b) Comments submitted by the state if applicable;

(c) Whether the plan contains responsive elements for each component required under § 37.139 of this part;

(d) Whether the plan, when viewed in its entirety, provides for paratransit service comparable to the entity's fixed route service;

(e) Whether the entity complied with the public participation efforts required by this part; and

(f) The extent to which efforts were made to coordinate with other public entities with overlapping or contiguous service areas or jurisdictions.

#### **§ 37.149 Disapproved plans.**

(a) If a plan is disapproved in whole or in part, UMTA will specify which provisions are disapproved. Each entity shall amend its plan consistent with this information and resubmit the plan to the appropriate UMTA Regional Office within 90 days of receipt of the disapproval letter.

(b) Each entity revising its plan shall continue to comply with the public participation requirements applicable to the initial development of the plan (set out in § 37.137 of this part).

#### **§ 37.151 Waiver for undue financial burden.**

If compliance with the service criteria of § 37.131 of this part creates an undue financial burden, an entity may request a waiver from all or some of the provisions if the entity has complied with the public participation requirements in § 37.137 of this Part and if the following conditions apply:

(a) At the time of submission of the initial plan on January 26, 1992—

(1) The entity determines that it cannot meet all of the service criteria by January 26, 1997; or

(2) The entity determines that it cannot make measured progress toward compliance in any year before full compliance is required. For purposes of this part, measured progress means implementing milestones as scheduled, such as incorporating an additional paratransit service criterion or improving an aspect of a specific service criterion.

(b) At the time of its annual plan update submission, if the entity believes that circumstances have changed since its last submission, and it is no longer able to comply by January 26, 1997, or make measured progress in any year before 1997, as described in paragraph (a)(2) of this section.

#### **§ 37.153 UMTA waiver determination.**

(a) The Administrator will determine whether to grant a waiver for undue financial burden on a case-by-case basis, after considering the factors identified in § 37.155 of this part and the information accompanying the request. If necessary, the Administrator will

return the application with a request for additional information.

(b) Any waiver granted will be for a limited and specified period of time.

(c) If the Administrator grants the applicant a waiver, the Administrator will do one of the following:

(1) Require the public entity to provide complementary paratransit to the extent it can do so without incurring an undue financial burden. The entity shall make changes in its plan that the Administrator determines are appropriate to maximize the complementary paratransit service that is provided to ADA paratransit eligible individuals. When making changes to its plan, the entity shall use the public participation process specified for plan development and shall consider first a reduction in number of trips provided to each ADA paratransit eligible person per month, while attempting to meet all other service criteria.

(2) Require the public entity to provide basic complementary paratransit services to all ADA paratransit eligible individuals, even if doing so would cause the public entity to incur an undue financial burden. Basic complementary paratransit service in corridors defined as provided in § 37.131(a) along the public entity's key routes during core service hours.

(i) For purposes of this section, key routes are defined as routes along which there is service at least hourly throughout the day.

(ii) For purposes of this section, core service hours encompass at least peak periods, as these periods are defined locally for fixed route service, consistent with industry practice.

(3) If the Administrator determines that the public entity will incur an undue financial burden as the result of providing basic complementary paratransit service, such that it is infeasible for the entity to provide basic complementary paratransit service, the Administrator shall require the public entity to coordinate with other available providers of demand responsive service in the area served by the public entity to maximize the service to ADA paratransit eligible individuals to the maximum extent feasible.

#### **§ 37.155 Factors in decision to grant an undue financial burden waiver.**

(a) In making an undue financial burden determination, the UMTA Administrator will consider the following factors:

(1) Effects on current fixed route service, including reallocation of accessible fixed route vehicles and potential reduction in service, measured by service miles;

(2) Average number of trips made by the entity's general population, on a per capita basis, compared with the average number of trips to be made by registered ADA paratransit eligible persons, on a per capita basis;

(3) Reductions in other services, including other special services;

(4) Increases in fares;

(5) Resources available to implement complementary paratransit service over the period covered by the plan;

(6) Percentage of budget needed to implement the plan, both as a percentage of operating budget and a percentage of entire budget;

(7) The current level of accessible service, both fixed route and paratransit;

(8) Cooperation/coordination among area transportation providers;

(9) Evidence of increased efficiencies, that have been or could be effectuated, that would benefit the level and quality of available resources for complementary paratransit service; and

(10) Unique circumstances in the submitting entity's area that affect the ability of the entity to provide paratransit, that militate against the need to provide paratransit, or in some other respect create a circumstance considered exceptional by the submitting entity.

(b)(1) Costs attributable to complementary paratransit shall be limited to costs of providing service specifically required by this part to ADA paratransit eligible individuals, by entities responsible under this part for providing such service.

(2) If the entity determines that it is impracticable to distinguish between trips mandated by the ADA and other trips on a trip-by-trip basis, the entity shall attribute to ADA complementary paratransit requirements a percentage of its overall paratransit costs. This percentage shall be determined by a statistically valid methodology that determines the percentage of trips that are required by this part. The entity shall submit information concerning its methodology and the data on which its percentage is based with its request for a waiver. Only costs attributable to ADA-mandated trips may be considered with respect to a request for an undue financial burden waiver.

(3) Funds to which the entity would be legally entitled, but which, as a matter of state or local funding arrangements, are provided to another entity and used by that entity to provide paratransit service which is part of a coordinated system of paratransit meeting the requirements of this part, may be

counted in determining the burden associated with the waiver request.

**§§ 37.157-37.159 [Reserved]**

**Subpart G—Provision of Service**

**§ 37.161 Maintenance of accessible features: General.**

(a) Public and private entities providing transportation services shall maintain in operative condition those features of facilities and vehicles that are required to make the vehicles and facilities readily accessible to and usable by individuals with disabilities. These features include, but are not limited to, lifts and other means of access to vehicles, securement devices, elevators, signage and systems to facilitate communications with persons with impaired vision or hearing.

(b) Accessibility features shall be repaired promptly if they are damaged or out of order. When an accessibility feature is out of order, the entity shall take reasonable steps to accommodate individuals with disabilities who would otherwise use the feature.

(c) This section does not prohibit isolated or temporary interruptions in service or access due to maintenance or repairs.

**§ 37.163 Keeping vehicle lifts in operative condition: Public entities.**

(a) This section applies only to public entities with respect to lifts in non-rail vehicles.

(b) The entity shall establish a system of regular and frequent maintenance checks of lifts sufficient to determine if they are operative.

(c) The entity shall ensure that vehicle operators report to the entity, by the most immediate means available, any failure of a lift to operate in service.

(d) Except as provided in paragraph (e) of this section, when a lift is discovered to be inoperative, the entity shall take the vehicle out of service before the beginning of the vehicle's next service day and ensure that the lift is repaired before the vehicle returns to service.

(e) If there is no spare vehicle available to take the place of a vehicle with an inoperable lift, such that taking the vehicle out of service will reduce the transportation service the entity is able to provide, the public entity may keep the vehicle in service with an inoperable lift for no more than five days (if the entity serves an area of 50,000 or less population) or three days (if the entity serves an area of over 50,000 population) from the day on which the lift is discovered to be inoperative.

(f) In any case in which a vehicle is operating on a fixed route with an

inoperative lift, and the headway to the next accessible vehicle on the route exceeds 30 minutes, the entity shall promptly provide alternative transportation to individuals with disabilities who are unable to use the vehicle because its lift does not work.

**§ 37.165 Lift and securement use.**

(a) This section applies to public and private entities.

(b) All common wheelchairs and their users shall be transported in the entity's vehicles or other conveyances. The entity is not required to permit wheelchairs to ride in places other than designated securement locations in the vehicle, where such locations exist.

(c) (1) For vehicles complying with part 38 of this title, the entity shall use the securement system to secure wheelchairs as provided in that Part.

(2) For other vehicles transporting individuals who use wheelchairs, the entity shall provide and use a securement system to ensure that the wheelchair remains within the securement area.

(3) The entity may require that an individual permit his or her wheelchair to be secured.

(d) The entity may not deny transportation to a wheelchair or its user on the ground that the device cannot be secured or restrained satisfactorily by the vehicle's securement system.

(e) The entity may recommend to a user of a wheelchair that the individual transfer to a vehicle seat. The entity may not require the individual to transfer.

(f) Where necessary or upon request, the entity's personnel shall assist individuals with disabilities with the use of securement systems, ramps and lifts. If it is necessary for the personnel to leave their seats to provide this assistance, they shall do so.

(g) The entity shall permit individuals with disabilities who do not use wheelchairs, including standees, to use a vehicle's lift or ramp to enter the vehicle.

**§ 37.167 Other service requirements.**

(a) This section applies to public and private entities.

(b) On fixed route systems, the entity shall announce stops as follows:

(1) The entity shall announce at least at transfer points with other fixed routes, other major intersections and destination points, and intervals along a route sufficient to permit individuals with visual impairments or other disabilities to be oriented to their location.

(2) The entity shall announce any stop on request of an individual with a disability.

(c) Where vehicles or other conveyances for more than one route serve the same stop, the entity shall provide a means by which an individual with a visual impairment or other disability can identify the proper vehicle to enter or be identified to the vehicle operator as a person seeking a ride on a particular route.

(d) The entity shall permit service animals to accompany individuals with disabilities in vehicles and facilities.

(e) The entity shall ensure that vehicle operators and other personnel make use of accessibility-related equipment or features required by part 38 of this title.

(f) The entity shall make available to individuals with disabilities adequate information concerning transportation services. This obligation includes making adequate communications capacity available, through accessible formats and technology, to enable users to obtain information and schedule service.

(g) The entity shall not refuse to permit a passenger who uses a lift to disembark from a vehicle at any designated stop, unless the lift cannot be deployed, the lift will be damaged if it is deployed, or temporary conditions at the stop, not under the control of the entity, preclude the safe use of the stop by all passengers.

(h) The entity shall not prohibit an individual with a disability from traveling with a respirator or portable oxygen supply, consistent with applicable Department of Transportation rules on the transportation of hazardous materials (49 CFR subtitle B, chapter 1, subchapter C).

(i) The entity shall ensure that adequate time is provided to allow individuals with disabilities to complete boarding or disembarking from the vehicle.

**§ 37.169 Interim requirements for over-the-road bus service operated by private entities.**

(a) Private entities operating over-the-road buses, in addition to compliance with other applicable provisions of this part, shall provide accessible service as provided in this section.

(b) The private entity shall provide assistance, as needed, to individuals with disabilities in boarding and disembarking, including moving to and from the bus seat for the purpose of boarding and disembarking. The private entity shall ensure that personnel are

trained to provide this assistance safely and appropriately.

(c) To the extent that they can be accommodated in the areas of the passenger compartment provided for passengers' personal effects, wheelchairs or other mobility aids and assistive devices used by individuals with disabilities, or components of such devices, shall be permitted in the passenger compartment. When the bus is at rest at a stop, the driver or other personnel shall assist individuals with disabilities with the stowage and retrieval of mobility aids, assistive devices, or other items that can be accommodated in the passenger compartment of the bus.

(d) Wheelchairs and other mobility aids or assistive devices that cannot be accommodated in the passenger compartment (including electric wheelchairs) shall be accommodated in the baggage compartment of the bus,

unless the size of the baggage compartment prevents such accommodation.

(e) At any given stop, individuals with disabilities shall have the opportunity to have their wheelchairs or other mobility aids or assistive devices stowed in the baggage compartment before other baggage or cargo is loaded, but baggage or cargo already on the bus does not have to be off-loaded in order to make room for such devices.

(f) The entity may require up to 48 hours' advance notice only for providing boarding assistance. If the individual does not provide such notice, the entity shall nonetheless provide the service if it can do so by making a reasonable effort, without delaying the bus service.

**§ 37.171 Equivalency requirement for demand responsive service operated by private entities not primarily engaged in the business of transporting people.**

A private entity not primarily engaged in the business of transporting people

which operates a demand responsive system shall ensure that its system, when viewed in its entirety, provides equivalent service to individuals with disabilities, including individuals who use wheelchairs, as it does to individuals without disabilities. The standards of § 37.105 shall be used to determine if the entity is providing equivalent service.

**§ 37.173 Training requirements.**

Each public or private entity which operates a fixed route or demand responsive system shall ensure that personnel are trained to proficiency, as appropriate to their duties, so that they operate vehicles and equipment safely and properly assist and treat individuals with disabilities who use the service in a respectful and courteous way, with appropriate attention to the difference among individuals with disabilities.

BILLING CODE 4910—62—M



## Appendix A to Part 37—Standards for Accessible Transportation Facilities

**ADA ACCESSIBILITY GUIDELINES  
FOR BUILDINGS AND FACILITIES  
TABLE OF CONTENTS**

<b>1. PURPOSE .....</b>	<b>1</b>
<b>2. GENERAL .....</b>	<b>1</b>
2.1 Provisions for Adults .....	1
2.2 Equivalent Facilitation .....	1
<b>3. MISCELLANEOUS INSTRUCTIONS AND DEFINITIONS .....</b>	<b>1</b>
3.1 Graphic Conventions .....	1
3.2 Dimensional Tolerances .....	2
3.3 Notes .....	2
3.4 General Terminology .....	2
3.5 Definitions .....	2
<b>4. ACCESSIBLE ELEMENTS AND SPACES:     SCOPE AND TECHNICAL REQUIREMENTS .....</b>	<b>5</b>
4.1 Minimum Requirements .....	5
4.1.1. Application .....	5
4.1.2. Accessible Sites and Exterior Facilities: New Construction .....	5
4.1.3. Accessible Buildings: New Construction .....	7
4.1.4. (Reserved) .....	10
4.1.5. Accessible Buildings: Additions .....	10
4.1.6. Accessible Buildings: Alterations .....	11
4.1.7. Accessible Buildings: Historic Preservation .....	13
4.2 Space Allowance and Reach Ranges .....	14
4.3 Accessible Route .....	15
4.4 Protruding Objects .....	21
4.5 Ground and Floor Surfaces .....	22
4.6 Parking and Passenger Loading Zones .....	24
4.7 Curb Ramps .....	26
4.8 Ramps .....	27
4.9 Stairs .....	30
4.10 Elevators .....	30

4.11 Platform Lifts (Wheelchair Lifts) .....	36
4.12 Windows .....	36
4.13 Doors .....	36
4.14 Entrances .....	40
4.15 Drinking Fountains and Water Coolers .....	40
4.16 Water Closets .....	40
4.17 Toilet Stalls .....	41
4.18 Urinals .....	44
4.19 Lavatories and Mirrors .....	44
4.20 Bathtubs .....	45
4.21 Shower Stalls .....	45
4.22 Toilet Rooms .....	45
4.23 Bathrooms, Bathing Facilities, and Shower Rooms .....	48
4.24 Sinks .....	49
4.25 Storage .....	49
4.26 Handrails, Grab Bars, and Tub and Shower Seats .....	50
4.27 Controls and Operating Mechanisms .....	51
4.28 Alarms .....	52
4.29 Detectable Warnings .....	53
4.30 Signage .....	53
4.31 Telephones .....	54
4.32 Fixed or Built-in Seating and Tables .....	56
4.33 Assembly Areas .....	56
4.34 Automated Teller Machines .....	58
4.35 Dressing and Fitting Rooms .....	58
<b>5. RESTAURANTS AND CAFETERIAS .....</b>	<b>59</b>
<b>6. MEDICAL CARE FACILITIES .....</b>	<b>60</b>
<b>7. BUSINESS AND MERCANTILE .....</b>	<b>61</b>
<b>8. LIBRARIES .....</b>	<b>62</b>
<b>9. ACCESSIBLE TRANSIENT LODGING .....</b>	<b>63</b>
<b>10. TRANSPORTATION FACILITIES .....</b>	<b>67</b>
<b>APPENDIX .....</b>	<b>A1</b>

## 1. PURPOSE.

*This document sets guidelines for accessibility to buildings and facilities by individuals with disabilities under the Americans with Disabilities Act (ADA) of 1990. These guidelines are to be applied during the design, construction, and alteration of buildings and facilities covered by Titles II and III of the ADA to the extent required by regulations issued by Federal agencies, including the Department of Justice and the Department of Transportation, under the ADA.*

*The technical specifications 4.2 through 4.35, of these guidelines are the same as those of the American National Standard Institute's document A117.1-1980, except as noted in this text by italics. However, sections 4.1.1 through 4.1.7 and sections 5 through 10 are different from ANSI A117.1 in their entirety and are printed in standard type.*

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## 2. GENERAL.



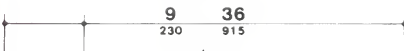

**2.1 Provisions for Adults.** *The specifications in these guidelines are based upon adult dimensions and anthropometrics.*

**2.2\* Equivalent Facilitation.** *Departures from particular technical and scoping requirements of this guideline by the use of other designs and technologies are permitted where the alternative designs and technologies used will provide substantially equivalent or greater access to and usability of the facility.*

## 3. MISCELLANEOUS INSTRUCTIONS AND DEFINITIONS.

**3.1 Graphic Conventions.** Graphic conventions are shown in Table 1. Dimensions that are not marked minimum or maximum are absolute, unless otherwise indicated in the text or captions.

Table 1  
Graphic Conventions

Convention	Description
	Typical dimension line showing U.S. customary units (in inches) above the line and SI units (in millimeters) below
	Dimensions for short distances indicated on extended line
	Dimension line showing alternate dimensions required
	Direction of approach
max	Maximum
min	Minimum
.....	Boundary of clear floor area
—+—	Centerline

### 3.4 General Terminology

**3.2 Dimensional Tolerances.** All dimensions are subject to conventional building industry tolerances for field conditions.

**3.3 Notes.** The text of *these guidelines* does not contain notes or footnotes. Additional information, explanations, and advisory materials are located in the Appendix. Paragraphs marked with an asterisk have related, non-mandatory material in the Appendix. In the Appendix, the corresponding paragraph numbers are preceded by an A.

### 3.4 General Terminology.

**comply with.** Meet one or more specifications of *these guidelines*.

**if...then.** Denotes a specification that applies only when the conditions described are present.

**may.** Denotes an option or alternative.

**shall.** Denotes a mandatory specification or requirement.

**should.** Denotes an advisory specification or recommendation.

### 3.5 Definitions.

**Access Aisle.** An accessible pedestrian space between elements, such as parking spaces, seating, and desks, that provides clearances appropriate for use of the elements.

**Accessible.** Describes a site, building, facility, or portion thereof that complies with *these guidelines*.

**Accessible Element.** An element specified by *these guidelines* (for example, telephone, controls, and the like).

**Accessible Route.** A continuous unobstructed path connecting all accessible elements and spaces of a building or facility. Interior accessible routes may include corridors, floors, ramps, elevators, lifts, and clear floor space at fixtures. Exterior accessible routes may include parking access aisles, curb ramps, crosswalks at vehicular ways, walks, ramps, and lifts.

**Accessible Space.** Space that complies with *these guidelines*.

**Adaptability.** The ability of certain building spaces and elements, such as kitchen counters, sinks, and grab bars, to be added or altered so as to accommodate the needs of individuals with or without disabilities or to accommodate the needs of persons with different types or degrees of disability.

**Addition.** An expansion, extension, or increase in the gross floor area of a building or facility.

**Administrative Authority.** A governmental agency that adopts or enforces regulations and guidelines for the design, construction, or alteration of buildings and facilities.

**Alteration.** An alteration is a change to a building or facility made by, on behalf of, or for the use of a public accommodation or commercial facility, that affects or could affect the usability of the building or facility or part thereof. Alterations include, but are not limited to, remodeling, renovation, rehabilitation, reconstruction, historic restoration, changes or rearrangement of the structural parts or elements, and changes or rearrangement in the plan configuration of walls and full-height partitions. Normal maintenance, reroofing, painting or wallpapering, or changes to mechanical and electrical systems are not alterations unless they affect the usability of the building or facility.

**Area of Rescue Assistance.** An area, which has direct access to an exit, where people who are unable to use stairs may remain temporarily in safety to await further instructions or assistance during emergency evacuation.

**Assembly Area.** A room or space accommodating a group of individuals for recreational, educational, political, social, or amusement purposes, or for the consumption of food and drink.

**Automatic Door.** A door equipped with a power-operated mechanism and controls that open and close the door automatically upon receipt of a momentary actuating signal. The switch that begins the automatic cycle may be a photoelectric device, floor mat, or manual switch (see power-assisted door).



## 3.5 Definitions

**Building.** Any structure used and intended for supporting or sheltering any use or occupancy.

**Circulation Path.** An exterior or interior way of passage from one place to another for pedestrians, including, but not limited to, walks, hallways, courtyards, stairways, and stair landings.

**Clear.** Unobstructed.

**Clear Floor Space.** The minimum unobstructed floor or ground space required to accommodate a single, stationary wheelchair and occupant.

**Closed Circuit Telephone.** A telephone with dedicated line(s) such as a house phone, courtesy phone or phone that must be used to gain entrance to a facility.

**Common Use.** Refers to those interior and exterior rooms, spaces, or elements that are made available for the use of a restricted group of people (for example, occupants of a homeless shelter, the occupants of an office building, or the guests of such occupants).

**Cross Slope.** The slope that is perpendicular to the direction of travel (see running slope).

**Curb Ramp.** A short ramp cutting through a curb or built up to it.

**Detectable Warning.** A standardized surface feature built in or applied to walking surfaces or other elements to warn visually impaired people of hazards on a circulation path.

**Dwelling Unit.** A single unit which provides a kitchen or food preparation area, in addition to rooms and spaces for living, bathing, sleeping, and the like. Dwelling units include a single family home or a townhouse used as a transient group home; an apartment building used as a shelter; guestrooms in a hotel that provide sleeping accommodations and food preparation areas; and other similar facilities used on a transient basis. For purposes of these guidelines, use of the term "Dwelling Unit" does not imply the unit is used as a residence.

**Egress, Means of.** A continuous and unobstructed way of exit travel from any point in a building or facility to a public way. A means of egress comprises vertical and horizontal travel

and may include intervening room spaces, doorways, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, horizontal exits, courts and yards. An accessible means of egress is one that complies with these guidelines and does not include stairs, steps, or escalators. Areas of rescue assistance or evacuation elevators may be included as part of accessible means of egress.

**Element.** An architectural or mechanical component of a building, facility, space, or site, e.g., telephone, curb ramp, door, drinking fountain, seating, or water closet.

**Entrance.** Any access point to a building or portion of a building or facility used for the purpose of entering. An entrance includes the approach walk, the vertical access leading to the entrance platform, the entrance platform itself, vestibules (if provided, the entry door(s) or gate(s), and the hardware of the entry door(s) or gate(s).

**Facility.** All or any portion of buildings, structures, site improvements, complexes, equipment, roads, walks, passageways, parking lots, or other real or personal property located on a site.

**Ground Floor.** Any occupiable floor less than one story above or below grade with direct access to grade. A building or facility always has at least one ground floor and may have more than one ground floor as where a split level entrance has been provided or where a building is built into a hillside.

**Mezzanine or Mezzanine Floor.** That portion of a story which is an intermediate floor level placed within the story and having occupiable space above and below its floor.

**Marked Crossing.** A crosswalk or other identified path intended for pedestrian use in crossing a vehicular way.

**Multifamily Dwelling.** Any building containing more than two dwelling units.

**Occupiable.** A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes, or in which occupants are engaged at labor, and which is equipped with means of egress, light, and ventilation.

### 3.5 Definitions

**Operable Part.** A part of a piece of equipment or appliance used to insert or withdraw objects, or to activate, deactivate, or adjust the equipment or appliance (for example, coin slot, pushbutton, handle).

**Path of Travel.** (Reserved).

**Power-assisted Door.** A door used for human passage with a mechanism that helps to open the door, or relieves the opening resistance of a door, upon the activation of a switch or a continued force applied to the door itself.

**Public Use.** Describes interior or exterior rooms or spaces that are made available to the general public. Public use may be provided at a building or facility that is privately or publicly owned.

**Ramp.** A walking surface which has a running slope greater than 1:20.

**Running Slope.** The slope that is parallel to the direction of travel (see cross slope).

**Service Entrance.** An entrance intended primarily for delivery of goods or services.

**Signage.** Displayed verbal, symbolic, tactile, and pictorial information.

**Site.** A parcel of land bounded by a property line or a designated portion of a public right-of-way.

**Site Improvement.** Landscaping, paving for pedestrian and vehicular ways, outdoor lighting, recreational facilities, and the like, added to a site.

**Sleeping Accommodations.** Rooms in which people sleep; for example, dormitory and hotel or motel guest rooms or suites.

**Space.** A definable area, e.g., room, toilet room, hall, assembly area, entrance, storage room, alcove, courtyard, or lobby.

**Story.** That portion of a building included between the upper surface of a floor and upper surface of the floor or roof next above. If such

portion of a building does not include occupiable space, it is not considered a story for purposes of these guidelines. There may be more than one floor level within a story as in the case of a mezzanine or mezzanines.

**Structural Frame.** The structural frame shall be considered to be the columns and the girders, beams, trusses and spandrels having direct connections to the columns and all other members which are essential to the stability of the building as a whole.

**Tactile.** Describes an object that can be perceived using the sense of touch.

**Text Telephone.** Machinery or equipment that employs interactive graphic (i.e., typed) communications through the transmission of coded signals across the standard telephone network. Text telephones can include, for example, devices known as TDD's (telecommunication display devices or telecommunication devices for deaf persons) or computers.

**Transient Lodging.** A building, facility, or portion thereof, excluding inpatient medical care facilities, that contains one or more dwelling units or sleeping accommodations. Transient lodging may include, but is not limited to, resorts, group homes, hotels, motels, and dormitories.

**Vehicular Way.** A route intended for vehicular traffic, such as a street, driveway, or parking lot.

**Walk.** An exterior pathway with a prepared surface intended for pedestrian use, including general pedestrian areas such as plazas and courts.

NOTE: Sections 4.1.1 through 4.1.7 are different from ANSI A117.1 in their entirety and are printed in standard type (ANSI A117.1 does not include scoping provisions).

**4.0 Accessible Elements and Spaces: Scope and Technical Requirements****4. ACCESSIBLE ELEMENTS AND SPACES: SCOPE AND TECHNICAL REQUIREMENTS.****4.1 Minimum Requirements****4.1.1\* Application.**

(1) General. All areas of newly designed or newly constructed buildings and facilities required to be accessible by 4.1.2 and 4.1.3 and altered portions of existing buildings and facilities required to be accessible by 4.1.6 shall comply with these guidelines, 4.1 through 4.35, unless otherwise provided in this section or as modified in a special application section.

(2) Application Based on Building Use. Special application sections 5 through 10 provide additional requirements for restaurants and cafeterias, medical care facilities, business and mercantile, libraries, accessible transient lodging, and transportation facilities. When a building or facility contains more than one use covered by a special application section, each portion shall comply with the requirements for that use.

(3)\* Areas Used Only by Employees as Work Areas. Areas that are used only as work areas shall be designed and constructed so that individuals with disabilities can approach, enter, and exit the areas. These guidelines do not require that any areas used only as work areas be constructed to permit maneuvering within the work area or be constructed or equipped (i.e., with racks or shelves) to be accessible.

(4) Temporary Structures. These guidelines cover temporary buildings or facilities as well as permanent facilities. Temporary buildings and facilities are not of permanent construction but are extensively used or are essential for public use for a period of time. Examples of temporary buildings or facilities covered by these guidelines include, but are not limited to: reviewing stands, temporary classrooms, bleacher areas, exhibit areas, temporary banking facilities, temporary health screening services, or temporary safe pedestrian passageways around a construction site. Structures,

sites and equipment directly associated with the actual processes of construction, such as scaffolding, bridging, materials hoists, or construction trailers are not included.

**(5) General Exceptions.**

(a) In new construction, a person or entity is not required to meet fully the requirements of these guidelines where that person or entity can demonstrate that it is structurally impracticable to do so. Full compliance will be considered structurally impracticable only in those rare circumstances when the unique characteristics of terrain prevent the incorporation of accessibility features. If full compliance with the requirements of these guidelines is structurally impracticable, a person or entity shall comply with the requirements to the extent it is not structurally impracticable. Any portion of the building or facility which can be made accessible shall comply to the extent that it is not structurally impracticable.

(b) Accessibility is not required to (i) observation galleries used primarily for security purposes; or (ii) in non-occupable spaces accessed only by ladders, catwalks, crawl spaces, very narrow passageways, or freight (non-passenger) elevators, and frequented only by service personnel for repair purposes; such spaces include, but are not limited to, elevator pits, elevator penthouses, piping or equipment catwalks.

**4.1.2 Accessible Sites and Exterior Facilities: New Construction.** An accessible site shall meet the following minimum requirements:

(1) At least one accessible route complying with 4.3 shall be provided within the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones if provided, and public streets or sidewalks, to an accessible building entrance.

(2) At least one accessible route complying with 4.3 shall connect accessible buildings, accessible facilities, accessible elements, and accessible spaces that are on the same site.

(3) All objects that protrude from surfaces or posts into circulation paths shall comply with 4.4.

**4.1.2 Accessible Sites and Exterior Facilities: New Construction**

(4) Ground surfaces along accessible routes and in accessible spaces shall comply with 4.5.

(5) (a) If parking spaces are provided for self-parking by employees or visitors, or both, then accessible spaces complying with 4.6 shall be provided in each such parking area in conformance with the table below. Spaces required by the table need not be provided in the particular lot. They may be provided in a different location if equivalent or greater accessibility, in terms of distance from an accessible entrance, cost and convenience is ensured.

<b>Total Parking in Lot</b>	<b>Required Minimum Number of Accessible Spaces</b>
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2 percent of total
1001 and over	20 plus 1 for each 100 over 1000

Except as provided in (b), access aisles adjacent to accessible spaces shall be 60 in (1525 mm) wide minimum.

(b) One in every eight accessible spaces, but not less than one, shall be served by an access aisle 96 in (2440 mm) wide minimum and shall be designated "van accessible" as required by 4.6.4. The vertical clearance at such spaces shall comply with 4.6.5. All such spaces may be grouped on one level of a parking structure.

EXCEPTION: Provision of all required parking spaces in conformance with "Universal Parking Design" (see appendix A4.6.3) is permitted.

(c) If passenger loading zones are provided, then at least one passenger loading zone shall comply with 4.6.6.

(d) At facilities providing medical care and other services for persons with mobility impairments, parking spaces complying with 4.6 shall

be provided in accordance with 4.1.2(5)(a) except as follows:

(i) Outpatient units and facilities: 10 percent of the total number of parking spaces provided serving each such outpatient unit or facility;

(ii) Units and facilities that specialize in treatment or services for persons with mobility impairments: 20 percent of the total number of parking spaces provided serving each such unit or facility.

(e)\*Valet parking: Valet parking facilities shall provide a passenger loading zone complying with 4.6.6 located on an accessible route to the entrance of the facility. Paragraphs 5(a), 5(b), and 5(d) of this section do not apply to valet parking facilities.

(6) If toilet facilities are provided on a site, then each such public or common use toilet facility shall comply with 4.22. If bathing facilities are provided on a site, then each such public or common use bathing facility shall comply with 4.23.

For single user portable toilet or bathing units clustered at a single location, at least 5% but no less than one toilet unit or bathing unit complying with 4.22 or 4.23 shall be installed at each cluster whenever typical inaccessible units are provided. Accessible units shall be identified by the International Symbol of Accessibility.

EXCEPTION: Portable toilet units at construction sites used exclusively by construction personnel are not required to comply with 4.1.2(6).

(7) Building Signage. Signs which designate permanent rooms and spaces shall comply with 4.30.1, 4.30.4, 4.30.5 and 4.30.6. Other signs which provide direction to, or information about, functional spaces of the building shall comply with 4.30.1, 4.30.2, 4.30.3, and 4.30.5. Elements and spaces of accessible facilities which shall be identified by the International Symbol of Accessibility and which shall comply with 4.30.7 are:

(a) Parking spaces designated as reserved for individuals with disabilities;



**4.1.3 Accessible Buildings: New Construction**

(b) Accessible passenger loading zones;

(c) Accessible entrances when not all are accessible (inaccessible entrances shall have directional signage to indicate the route to the nearest accessible entrance);

(d) Accessible toilet and bathing facilities when not all are accessible.

**4.1.3 Accessible Buildings: New Construction.**

Accessible buildings and facilities shall meet the following minimum requirements:

(1) At least one accessible route complying with 4.3 shall connect accessible building or facility entrances with all accessible spaces and elements within the building or facility.

(2) All objects that overhang or protrude into circulation paths shall comply with 4.4.

(3) Ground and floor surfaces along accessible routes and in accessible rooms and spaces shall comply with 4.5.

(4) Interior and exterior stairs connecting levels that are not connected by an elevator, ramp, or other accessible means of vertical access shall comply with 4.9.

(5)\* One passenger elevator complying with 4.10 shall serve each level, including mezzanines, in all multi-story buildings and facilities unless exempted below. If more than one elevator is provided, each full passenger elevator shall comply with 4.10.

**EXCEPTION 1:** Elevators are not required in facilities that are less than three stories or that have less than 3000 square feet per story unless the building is a shopping center, a shopping mall, or the professional office of a health care provider, or another type of facility as determined by the Attorney General. The elevator exemption set forth in this paragraph does not obviate or limit in any way the obligation to comply with the other accessibility requirements established in section 4.1.3. For example, floors above or below the accessible ground floor must meet the requirements of this section except for elevator service. If toilet or bathing facilities are provided on a level not served by an elevator, then toilet or bathing facilities must be provided on the accessible

ground floor. In new construction if a building or facility is eligible for this exemption but a full passenger elevator is nonetheless planned, that elevator shall meet the requirements of 4.10 and shall serve each level in the building. A full passenger elevator that provides service from a garage to only one level of a building or facility is not required to serve other levels.

**EXCEPTION 2:** Elevator pits, elevator penthouses, mechanical rooms, piping or equipment catwalks are exempted from this requirement.

**EXCEPTION 3:** Accessible ramps complying with 4.8 may be used in lieu of an elevator.

**EXCEPTION 4:** Platform lifts (wheelchair lifts) complying with 4.11 of this guideline and applicable state or local codes may be used in lieu of an elevator only under the following conditions:

(a) To provide an accessible route to a performing area in an assembly occupancy.

(b) To comply with the wheelchair viewing position line-of-sight and dispersion requirements of 4.33.3.

(c) To provide access to incidental occupiable spaces and rooms which are not open to the general public and which house no more than five persons, including but not limited to equipment control rooms and projection booths.

(d) To provide access where existing site constraints or other constraints make use of a ramp or an elevator infeasible.

(6) Windows: (Reserved).

(7) Doors:

(a) At each accessible entrance to a building or facility, at least one door shall comply with 4.13.

(b) Within a building or facility, at least one door at each accessible space shall comply with 4.13.

(c) Each door that is an element of an accessible route shall comply with 4.13.

### 4.1.3 Accessible Buildings: New Construction

(d) Each door required by 4.3.10, Egress, shall comply with 4.13.

(8) In new construction, at a minimum, the requirements in (a) and (b) below shall be satisfied independently:

(a)(i) At least 50% of all public entrances (excluding those in (b) below) must be accessible. At least one must be a ground floor entrance. Public entrances are any entrances that are not loading or service entrances.

(ii) Accessible entrances must be provided in a number at least equivalent to the number of exits required by the applicable building/fire codes. (This paragraph does not require an increase in the total number of entrances planned for a facility.)

(iii) An accessible entrance must be provided to each tenancy in a facility (for example, individual stores in a strip shopping center).

One entrance may be considered as meeting more than one of the requirements in (a). Where feasible, accessible entrances shall be the entrances used by the majority of people visiting or working in the building.

(b)(i) In addition, if direct access is provided for pedestrians from an enclosed parking garage to the building, at least one direct entrance from the garage to the building must be accessible.

(ii) If access is provided for pedestrians from a pedestrian tunnel or elevated walkway, one entrance to the building from each tunnel or walkway must be accessible.

One entrance may be considered as meeting more than one of the requirements in (b).

Because entrances also serve as emergency exits whose proximity to all parts of buildings and facilities is essential, it is preferable that all entrances be accessible.

(c) If the only entrance to a building, or tenancy in a facility, is a service entrance, that entrance shall be accessible.

(d) Entrances which are not accessible shall have directional signage complying with 4.30.1,

4.30.2, 4.30.3, and 4.30.5, which indicates the location of the nearest accessible entrance.

(9)\* In buildings or facilities, or portions of buildings or facilities, required to be accessible, accessible means of egress shall be provided in the same number as required for exits by local building/life safety regulations. Where a required exit from an occupable level above or below a level of accessible exit discharge is not accessible, an area of rescue assistance shall be provided on each such level (in a number equal to that of inaccessible required exits). Areas of rescue assistance shall comply with 4.3.11. A horizontal exit, meeting the requirements of local building/life safety regulations, shall satisfy the requirement for an area of rescue assistance.

EXCEPTION: Areas of rescue assistance are not required in buildings or facilities having a supervised automatic sprinkler system.

#### (10)\* Drinking Fountains:

(a) Where only one drinking fountain is provided on a floor there shall be a drinking fountain which is accessible to individuals who use wheelchairs in accordance with 4.15 and one accessible to those who have difficulty bending or stooping. (This can be accommodated by the use of a "hi-lo" fountain; by providing one fountain accessible to those who use wheelchairs and one fountain at a standard height convenient for those who have difficulty bending; by providing a fountain accessible under 4.15 and a water cooler; or by such other means as would achieve the required accessibility for each group on each floor.)

(b) Where more than one drinking fountain or water cooler is provided on a floor, 50% of those provided shall comply with 4.15 and shall be on an accessible route.

(11) Toilet Facilities: If toilet rooms are provided, then each public and common use toilet room shall comply with 4.22. Other toilet rooms provided for the use of occupants of specific spaces (i.e., a private toilet room for the occupant of a private office) shall be adaptable. If bathing rooms are provided, then each public and common use bathroom shall comply with 4.23. Accessible toilet rooms and bathing facilities shall be on an accessible route.

## 4.1.3 Accessible Buildings: New Construction

## (12) Storage, Shelving and Display Units:

(a) If fixed or built-in storage facilities such as cabinets, shelves, closets, and drawers are provided in accessible spaces, at least one of each type provided shall contain storage space complying with 4.25. Additional storage may be provided outside of the dimensions required by 4.25.

(b) Shelves or display units allowing self-service by customers in mercantile occupancies shall be located on an accessible route complying with 4.3. Requirements for accessible reach range do not apply.

(13) Controls and operating mechanisms in accessible spaces, along accessible routes, or as parts of accessible elements (for example, light switches and dispenser controls) shall comply with 4.27.

(14) If emergency warning systems are provided, then they shall include both audible alarms and visual alarms complying with 4.28. Sleeping accommodations required to comply with 9.3 shall have an alarm system complying with 4.28. Emergency warning systems in medical care facilities may be modified to suit standard health care alarm design practice.

(15) Detectable warnings shall be provided at locations as specified in 4.29.

## (16) Building Signage:

(a) Signs which designate permanent rooms and spaces shall comply with 4.30.1, 4.30.4, 4.30.5 and 4.30.6.

(b) Other signs which provide direction to or information about functional spaces of the building shall comply with 4.30.1, 4.30.2, 4.30.3, and 4.30.5.

EXCEPTION: Building directories, menus, and all other signs which are temporary are not required to comply.

## (17) Public Telephones:

(a) If public pay telephones, public closed circuit telephones, or other public telephones are provided, then they shall comply with 4.31.2 through 4.31.8 to the extent required by the following table:

Number of each type of telephone provided on each floor	Number of telephones required to comply with 4.31.2 through 4.31.8 <sup>1</sup>
1 or more single unit	1 per floor
1 bank <sup>2</sup>	1 per floor
2 or more banks <sup>2</sup>	1 per bank. Accessible unit may be installed as a single unit in proximity (either visible or with signage) to the bank. At least one public telephone per floor shall meet the requirements for a forward reach telephone <sup>3</sup> .

<sup>1</sup> Additional public telephones may be installed at any height. Unless otherwise specified, accessible telephones may be either forward or side reach telephones.

<sup>2</sup> A bank consists of two or more adjacent public telephones, often installed as a unit.

<sup>3</sup> EXCEPTION: For exterior installations only, if dial tone first service is available, then a side reach telephone may be installed instead of the required forward reach telephone (i.e., one telephone in proximity to each bank shall comply with 4.31).

(b)\* All telephones required to be accessible and complying with 4.31.2 through 4.31.8 shall be equipped with a volume control. In addition, 25 percent, but never less than one, of all other public telephones provided shall be equipped with a volume control and shall be dispersed among all types of public telephones, including closed circuit telephones, throughout the building or facility. Signage complying with applicable provisions of 4.30.7 shall be provided.

(c) The following shall be provided in accordance with 4.31.9:

(i) If a total number of four or more public pay telephones (including both interior and exterior phones) is provided at a site, and at least one is in an interior location, then at least one interior public text telephone shall be provided.

(ii) If an interior public pay telephone is provided in a stadium or arena, in a convention center, in a hotel with a convention center, or

**4.1.3 Accessible Buildings: New Construction**

In a covered mall, at least one interior public text telephone shall be provided in the facility.

(iii) If a public pay telephone is located in or adjacent to a hospital emergency room, hospital recovery room, or hospital waiting room, one public text telephone shall be provided at each such location.

(d) Where a bank of telephones in the interior of a building consists of three or more public pay telephones, at least one public pay telephone in each such bank shall be equipped with a shelf and outlet in compliance with 4.31.9(2).

(18) If fixed or built-in seating or tables (including, but not limited to, study carrels and student laboratory stations), are provided in accessible public or common use areas, at least five percent (5%), but not less than one, of the fixed or built-in seating areas or tables shall comply with 4.32. An accessible route shall lead to and through such fixed or built-in seating areas, or tables.

(19)\* Assembly areas:

(a) In places of assembly with fixed seating accessible wheelchair locations shall comply with 4.33.2, 4.33.3, and 4.33.4 and shall be provided consistent with the following table:

**Capacity of Seating  
in Assembly Areas      Number of Required  
Wheelchair Locations**

4 to 25	1
26 to 50	2
51 to 300	4
301 to 500	6
over 500	6, plus 1 additional space for each total seating capacity increase of 100

In addition, one percent, but not less than one, of all fixed seats shall be aisle seats with no armrests on the aisle side, or removable or folding armrests on the aisle side. Each such seat shall be identified by a sign or marker. Signage notifying patrons of the availability of such seats shall be posted at the ticket office. Aisle seats are not required to comply with 4.33.4.

(b) This paragraph applies to assembly areas where audible communications are integral to the use of the space (e.g., concert and lecture halls, playhouses and movie theaters, meeting rooms, etc.). Such assembly areas, if (1) they accommodate at least 50 persons, or if they have audio-amplification systems, and (2) they have fixed seating, shall have a permanently installed assistive listening system complying with 4.33. For other assembly areas, a permanently installed assistive listening system, or an adequate number of electrical outlets or other supplementary wiring necessary to support a portable assistive listening system shall be provided. The minimum number of receivers to be provided shall be equal to 4 percent of the total number of seats, but in no case less than two. Signage complying with applicable provisions of 4.30 shall be installed to notify patrons of the availability of a listening system.

(20) Where automated teller machines (ATMs) are provided, each ATM shall comply with the requirements of 4.34 except where two or more are provided at a location, then only one must comply.

EXCEPTION: Drive-up-only automated teller machines are not required to comply with 4.27.2, 4.27.3 and 4.34.3.

(21) Where dressing and fitting rooms are provided for use by the general public, patients, customers or employees, 5 percent, but never less than one, of dressing rooms for each type of use in each cluster of dressing rooms shall be accessible and shall comply with 4.35.

Examples of types of dressing rooms are those serving different genders or distinct and different functions as in different treatment or examination facilities.

**4.1.4 (Reserved).**

**4.1.5 Accessible Buildings: Additions.**

Each addition to an existing building or facility shall be regarded as an alteration. Each space or element added to the existing building or facility shall comply with the applicable provisions of 4.1.1 to 4.1.3, Minimum Requirements (for New Construction) and the applicable technical specifications of 4.2 through 4.35 and sections 5 through 10. Each addition that



**4.1.6 Accessible Buildings: Alterations**

affects or could affect the usability of an area containing a primary function shall comply with 4.1.6(2).

**4.1.6 Accessible Buildings: Alterations.**

(1) General. Alterations to existing buildings and facilities shall comply with the following:

(a) No alteration shall be undertaken which decreases or has the effect of decreasing accessibility or usability of a building or facility below the requirements for new construction at the time of alteration.

(b) If existing elements, spaces, or common areas are altered, then each such altered element, space, feature, or area shall comply with the applicable provisions of 4.1.1 to 4.1.3 Minimum Requirements (for New Construction). If the applicable provision for new construction requires that an element, space, or common area be on an accessible route, the altered element, space, or common area is not required to be on an accessible route except as provided in 4.1.6(2) (Alterations to an Area Containing a Primary Function.)

(c) If alterations of single elements, when considered together, amount to an alteration of a room or space in a building or facility, the entire space shall be made accessible.

(d) No alteration of an existing element, space, or area of a building or facility shall impose a requirement for greater accessibility than that which would be required for new construction. For example, if the elevators and stairs in a building are being altered and the elevators are, in turn, being made accessible, then no accessibility modifications are required to the stairs connecting levels connected by the elevator. If stair modifications to correct unsafe conditions are required by other codes, the modifications shall be done in compliance with these guidelines unless technically infeasible.

(e) At least one interior public text telephone complying with 4.31.9 shall be provided if:

(i) alterations to existing buildings or facilities with less than four exterior or interior public pay telephones would increase the total number to four or more telephones with at least one in an interior location; or

(ii) alterations to one or more exterior or interior public pay telephones occur in an existing building or facility with four or more public telephones with at least one in an interior location.

(f) If an escalator or stair is planned or installed where none existed previously and major structural modifications are necessary for such installation, then a means of accessible vertical access shall be provided that complies with the applicable provisions of 4.7, 4.8, 4.10, or 4.11.

(g) In alterations, the requirements of 4.1.3(9), 4.3.10 and 4.3.11 do not apply.

(h)\*Entrances: If a planned alteration entails alterations to an entrance, and the building has an accessible entrance, the entrance being altered is not required to comply with 4.1.3(8), except to the extent required by 4.1.6(2). If a particular entrance is not made accessible, appropriate accessible signage indicating the location of the nearest accessible entrance(s) shall be installed at or near the inaccessible entrance, such that a person with disabilities will not be required to retrace the approach route from the inaccessible entrance.

(i) If the alteration work is limited solely to the electrical, mechanical, or plumbing system, or to hazardous material abatement, or automatic sprinkler retrofitting, and does not involve the alteration of any elements or spaces required to be accessible under these guidelines, then 4.1.6(2) does not apply.

(j) EXCEPTION: In alteration work, if compliance with 4.1.6 is technically infeasible, the alteration shall provide accessibility to the maximum extent feasible. Any elements or features of the building or facility that are being altered and can be made accessible shall be made accessible within the scope of the alteration.

**Technically Infeasible.** Means, with respect to an alteration of a building or a facility, that it has little likelihood of being accomplished because existing structural conditions would require removing or altering a load-bearing member which is an essential part of the structural frame; or because other existing physical or site constraints prohibit modification or

#### 4.1.6 Accessible Buildings: Alterations

addition of elements, spaces, or features which are in full and strict compliance with the minimum requirements for new construction and which are necessary to provide accessibility.

**(k) EXCEPTION:**

(i) These guidelines do not require the installation of an elevator in an altered facility that is less than three stories or has less than 3,000 square feet per story unless the building is a shopping center, a shopping mall, the professional office of a health care provider, or another type of facility as determined by the Attorney General.

(ii) The exemption provided in paragraph (i) does not obviate or limit in any way the obligation to comply with the other accessibility requirements established in these guidelines. For example, alterations to floors above or below the ground floor must be accessible regardless of whether the altered facility has an elevator. If a facility subject to the elevator exemption set forth in paragraph (i) nonetheless has a full passenger elevator, that elevator shall meet, to the maximum extent feasible, the accessibility requirements of these guidelines.

(2) Alterations to an Area Containing a Primary Function: In addition to the requirements of 4.1.6(1), an alteration that affects or could affect the usability of or access to an area containing a primary function shall be made so as to ensure that, to the maximum extent feasible, the path of travel to the altered area and the restrooms, telephones, and drinking fountains serving the altered area, are readily accessible to and usable by individuals with disabilities, unless such alterations are disproportionate to the overall alterations in terms of cost and scope (as determined under criteria established by the Attorney General).

**(3) Special Technical Provisions for Alterations to Existing Buildings and Facilities:**

(a) Ramps: Curb ramps and interior or exterior ramps to be constructed on sites or in existing buildings or facilities where space limitations prohibit the use of a 1:12 slope or less may have slopes and rises as follows:

(i) A slope between 1:10 and 1:12 is allowed for a maximum rise of 6 inches.

(ii) A slope between 1:8 and 1:10 is allowed for a maximum rise of 3 inches. A slope steeper than 1:8 is not allowed.

(b) Stairs: Full extension of handrails at stairs shall not be required in alterations where such extensions would be hazardous or impossible due to plan configuration.

**(c) Elevators:**

(i) If safety door edges are provided in existing automatic elevators, automatic door reopening devices may be omitted (see 4.10.6).

(ii) Where existing shaft configuration or technical infeasibility prohibits strict compliance with 4.10.9, the minimum car plan dimensions may be reduced by the minimum amount necessary, but in no case shall the inside car area be smaller than 48 in by 48 in.

(iii) Equivalent facilitation may be provided with an elevator car of different dimensions when usability can be demonstrated and when all other elements required to be accessible comply with the applicable provisions of 4.10. For example, an elevator of 47 in by 69 in (1195 mm by 1755 mm) with a door opening on the narrow dimension, could accommodate the standard wheelchair clearances shown in Figure 4.

**(d) Doors:**

(i) Where it is technically infeasible to comply with clear opening width requirements of 4.13.5, a projection of 5/8 in maximum will be permitted for the latch side stop.

(ii) If existing thresholds are 3/4 in high or less, and have (or are modified to have) a beveled edge on each side, they may remain.

**(e) Toilet Rooms:**

(i) Where it is technically infeasible to comply with 4.22 or 4.23, the installation of at least one unisex toilet/bathroom per floor, located in the same area as existing toilet facilities, will be permitted in lieu of modifying existing toilet facilities to be accessible. Each unisex toilet room shall contain one water closet complying with 4.16 and one lavatory complying with 4.19, and the door shall have a privacy latch.

**4.1.7 Accessible Buildings: Historic Preservation**

(ii) Where it is technically infeasible to install a required standard stall (Fig. 30(a)), or where other codes prohibit reduction of the fixture count (i.e., removal of a water closet in order to create a double-wide stall), either alternate stall (Fig. 30(b)) may be provided in lieu of the standard stall.

(iii) When existing toilet or bathing facilities are being altered and are not made accessible, signage complying with 4.30.1, 4.30.2, 4.30.3, 4.30.5, and 4.30.7 shall be provided indicating the location of the nearest accessible toilet or bathing facility within the facility.

(f) Assembly Areas:

(i) Where it is technically infeasible to disperse accessible seating throughout an altered assembly area, accessible seating areas may be clustered. Each accessible seating area shall have provisions for companion seating and shall be located on an accessible route that also serves as a means of emergency egress.

(ii) Where it is technically infeasible to alter all performing areas to be on an accessible route, at least one of each type of performing area shall be made accessible.

(g) Platform Lifts (Wheelchair Lifts): In alterations, platform lifts (wheelchair lifts) complying with 4.1.1 and applicable state or local codes may be used as part of an accessible route. The use of lifts is not limited to the four conditions in exception 4 of 4.1.3(5).

(h) Dressing Rooms: In alterations where technical infeasibility can be demonstrated, one dressing room for each sex on each level shall be made accessible. Where only unisex dressing rooms are provided, accessible unisex dressing rooms may be used to fulfill this requirement.

**4.1.7 Accessible Buildings: Historic Preservation.**

(1) Applicability:

(a) General Rule. Alterations to a qualified historic building or facility shall comply with 4.1.6 Accessible Buildings: Alterations, the applicable technical specifications of 4.2

through 4.35 and the applicable special application sections 5 through 10 unless it is determined in accordance with the procedures in 4.1.7(2) that compliance with the requirements for accessible routes (exterior and interior), ramps, entrances, or toilets would threaten or destroy the historic significance of the building or facility in which case the alternative requirements in 4.1.7(3) may be used for the feature.

EXCEPTION: (Reserved).

(b) Definition. A qualified historic building or facility is a building or facility that is:

(i) Listed in or eligible for listing in the National Register of Historic Places; or

(ii) Designated as historic under an appropriate State or local law.

(2) Procedures:

(a) Alterations to Qualified Historic Buildings and Facilities Subject to Section 106 of the National Historic Preservation Act:

(i) Section 106 Process. Section 106 of the National Historic Preservation Act (16 U.S.C. 470 f) requires that a Federal agency with jurisdiction over a Federal, federally assisted, or federally licensed undertaking consider the effects of the agency's undertaking on buildings and facilities listed in or eligible for listing in the National Register of Historic Places and give the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking prior to approval of the undertaking.

(ii) ADA Application. Where alterations are undertaken to a qualified historic building or facility that is subject to section 106 of the National Historic Preservation Act, the Federal agency with jurisdiction over the undertaking shall follow the section 106 process. If the State Historic Preservation Officer or Advisory Council on Historic Preservation agrees that compliance with the requirements for accessible routes (exterior and interior), ramps, entrances, or toilets would threaten or destroy the historic significance of the building or facility, the alternative requirements in 4.1.7(3) may be used for the feature.

## 4.2 Space Allowance and Reach Ranges

(b) Alterations to Qualified Historic Buildings and Facilities Not Subject to Section 106 of the National Historic Preservation Act. Where alterations are undertaken to a qualified historic building or facility that is not subject to section 106 of the National Historic Preservation Act, if the entity undertaking the alterations believes that compliance with the requirements for accessible routes (exterior and interior), ramps, entrances, or toilets would threaten or destroy the historic significance of the building or facility and that the alternative requirements in 4.1.7(3) should be used for the feature, the entity should consult with the State Historic Preservation Officer. If the State Historic Preservation Officer agrees that compliance with the accessibility requirements for accessible routes (exterior and interior), ramps, entrances or toilets would threaten or destroy the historical significance of the building or facility, the alternative requirements in 4.1.7(3) may be used.

(c) Consultation With Interested Persons. Interested persons should be invited to participate in the consultation process, including State or local accessibility officials, individuals with disabilities, and organizations representing individuals with disabilities.

(d) Certified Local Government Historic Preservation Programs. Where the State Historic Preservation Officer has delegated the consultation responsibility for purposes of this section to a local government historic preservation program that has been certified in accordance with section 101(c) of the National Historic Preservation Act of 1966 (16 U.S.C. 470a (c)) and implementing regulations (36 CFR 61.5), the responsibility may be carried out by the appropriate local government body or official.

### (3) Historic Preservation: Minimum Requirements:

(a) At least one accessible route complying with 4.3 from a site access point to an accessible entrance shall be provided.

**EXCEPTION:** A ramp with a slope no greater than 1:6 for a run not to exceed 2 ft (610 mm) may be used as part of an accessible route to an entrance.

(b) At least one accessible entrance complying with 4.14 which is used by the public shall be provided.

**EXCEPTION:** If it is determined that no entrance used by the public can comply with 4.14, then access at any entrance not used by the general public but open (unlocked) with directional signage at the primary entrance may be used. The accessible entrance shall also have a notification system. Where security is a problem, remote monitoring may be used.

(c) If toilets are provided, then at least one toilet facility complying with 4.22 and 4.1.6 shall be provided along an accessible route that complies with 4.3. Such toilet facility may be unless in design.

(d) Accessible routes from an accessible entrance to all publicly used spaces on at least the level of the accessible entrance shall be provided. Access shall be provided to all levels of a building or facility in compliance with 4.1 whenever practical.

(e) Displays and written information, documents, etc., should be located where they can be seen by a seated person. Exhibits and signage displayed horizontally (e.g., open books), should be no higher than 44 in (1120 mm) above the floor surface.

**NOTE:** The technical provisions of sections 4.2 through 4.35 are the same as those of the American National Standard Institute's document A117.1-1980, except as noted in the text.

## 4.2 Space Allowance and Reach Ranges.

**4.2.1\* Wheelchair Passage Width.** The minimum clear width for single wheelchair passage shall be 32 in (815 mm) at a point and 36 in (915 mm) continuously (see Fig. 1 and 24(e)).

**4.2.2 Width for Wheelchair Passing.** The minimum width for two wheelchairs to pass is 60 in (1525 mm) (see Fig. 2).

**4.2.3\* Wheelchair Turning Space.** The space required for a wheelchair to make a 180-degree turn is a clear space of 60 in (1525 mm)

#### 4.2.4\* Clear Floor or Ground Space for Wheelchairs

diameter (see Fig. 3(a)) or a T-shaped space (see Fig. 3(b)).

##### 4.2.4\* Clear Floor or Ground Space for Wheelchairs.

**4.2.4.1 Size and Approach.** The minimum clear floor or ground space required to accommodate a single, stationary wheelchair and occupant is 30 in by 48 in (760 mm by 1220 mm) (see Fig. 4(a)). The minimum clear floor or ground space for wheelchairs may be positioned for forward or parallel approach to an object (see Fig. 4(b) and (c)). Clear floor or ground space for wheelchairs may be part of the knee space required under some objects.

**4.2.4.2 Relationship of Maneuvering Clearance to Wheelchair Spaces.** One full unobstructed side of the clear floor or ground space for a wheelchair shall adjoin or overlap an accessible route or adjoin another wheelchair clear floor space. If a clear floor space is located in an alcove or otherwise confined on all or part of three sides, additional maneuvering clearances shall be provided as shown in Fig. 4(d) and (e).

**4.2.4.3 Surfaces for Wheelchair Spaces.** Clear floor or ground spaces for wheelchairs shall comply with 4.5.

**4.2.5\* Forward Reach.** If the clear floor space only allows forward approach to an object, the maximum high forward reach allowed shall be 48 in (1220 mm) (see Fig. 5(a)). The minimum low forward reach is 15 in (380 mm). If the high forward reach is over an obstruction, reach and clearances shall be as shown in Fig. 5(b).

**4.2.6\* Side Reach.** If the clear floor space allows parallel approach by a person in a wheelchair, the maximum high side reach allowed shall be 54 in (1370 mm) and the low side reach shall be no less than 9 in (230 mm) above the floor (Fig. 6(a) and (b)). If the side reach is over an obstruction, the reach and clearances shall be as shown in Fig. 6(c).

#### 4.3 Accessible Route.

**4.3.1\* General.** All walks, halls, corridors, aisles, skywalks, tunnels, and other spaces

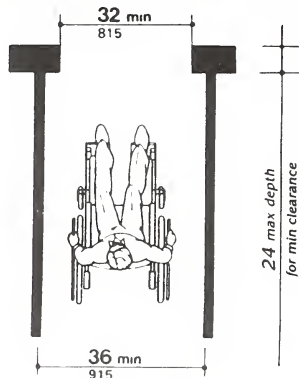


Fig. 1  
Minimum Clear Width  
for Single Wheelchair

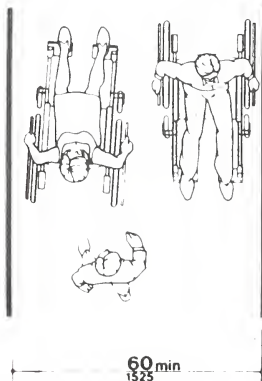


Fig. 2  
Minimum Clear Width  
for Two Wheelchairs



### 4.3 Accessible Route

that are part of an accessible route shall comply with 4.3.

#### 4.3.2 Location.

(1) At least one accessible route *within the boundary of the site* shall be provided from public transportation stops, accessible parking, and accessible passenger loading zones, and public streets or sidewalks to the accessible building entrance they serve. *The accessible route shall, to the maximum extent feasible, coincide with the route for the general public.*

(2) At least one accessible route shall connect accessible buildings, facilities, elements, and spaces that are on the same site.

(3) At least one accessible route shall connect accessible building or facility entrances with all accessible spaces and elements and with all accessible dwelling units within the building or facility.

(4) An accessible route shall connect at least one accessible entrance of each accessible

dwelling unit with those exterior and interior spaces and facilities that serve the accessible dwelling unit.

**4.3.3 Width.** The minimum clear width of an accessible route shall be 36 in (915 mm) except at doors (see 4.13.5 and 4.13.6). If a person in a wheelchair must make a turn around an obstruction, the minimum clear width of the accessible route shall be as shown in Fig. 7(a) and (b).

**4.3.4 Passing Space.** If an accessible route has less than 60 in (1525 mm) clear width, then passing spaces at least 60 in by 60 in (1525 mm by 1525 mm) shall be located at reasonable intervals not to exceed 200 ft (61 m). A T-intersection of two corridors or walks is an acceptable passing place.

**4.3.5 Head Room.** Accessible routes shall comply with 4.4.2.

**4.3.6 Surface Textures.** The surface of an accessible route shall comply with 4.5.

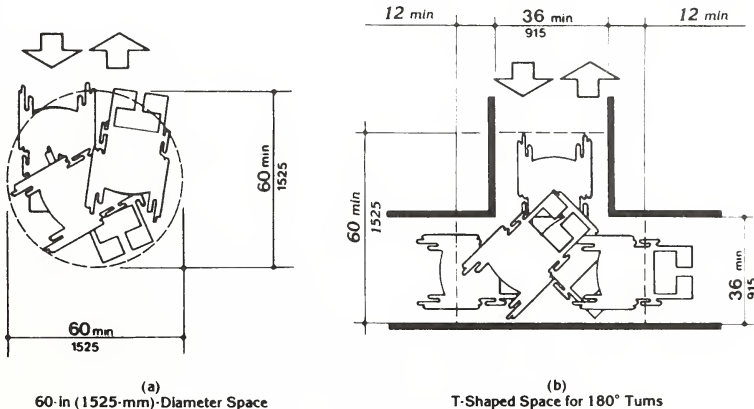


Fig. 3  
Wheelchair Turning Space

## 4.3 Accessible Route

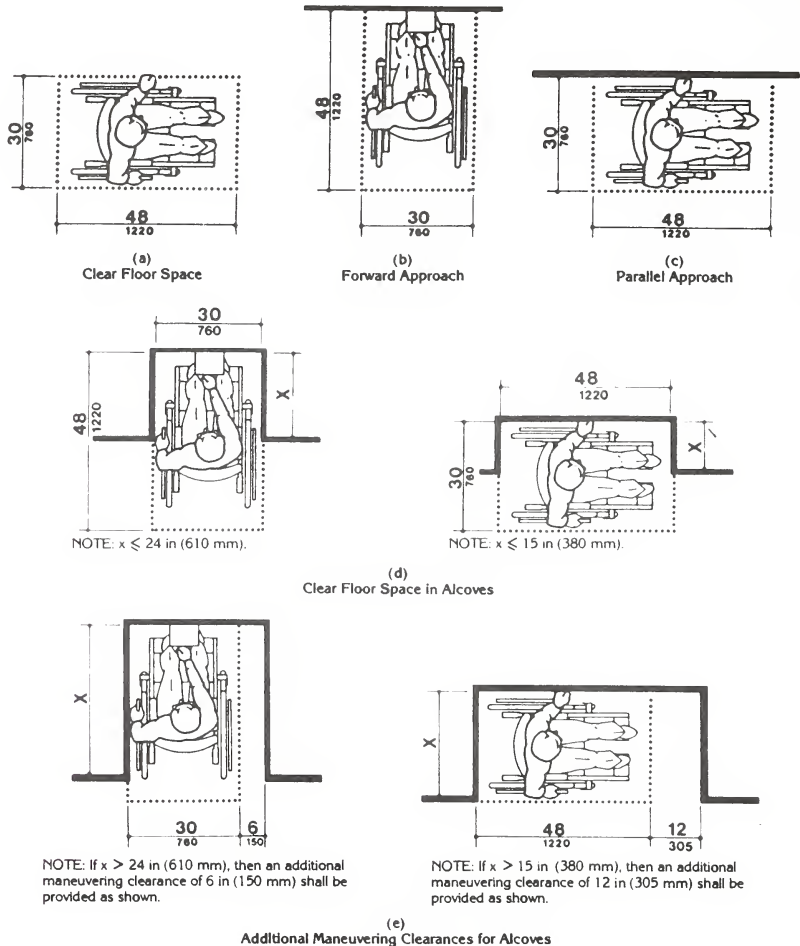
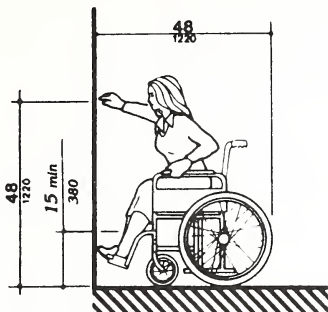
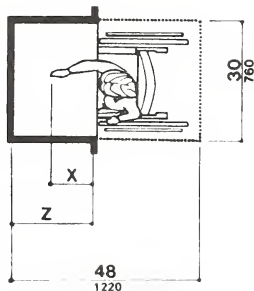
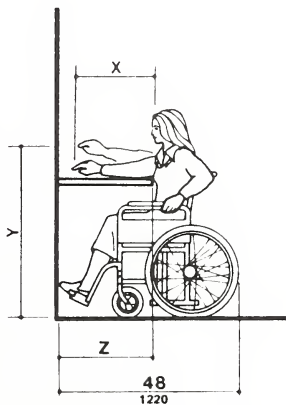
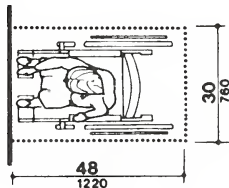


Fig. 4  
Minimum Clear Floor Space for Wheelchairs

## 4.3 Accessible Route

(a)  
High Forward Reach Limit

NOTE: x shall be  $\leq 25$  in (635 mm); z shall be  $\geq x$ . When  $x < 20$  in (510 mm), then y shall be 48 in (1220 mm) maximum. When x is 20 to 25 in (510 to 635 mm), then y shall be 44 in (1120 mm) maximum.

(b)  
Maximum Forward Reach over an ObstructionFig. 5  
Forward Reach



## 4.3.7 Slope

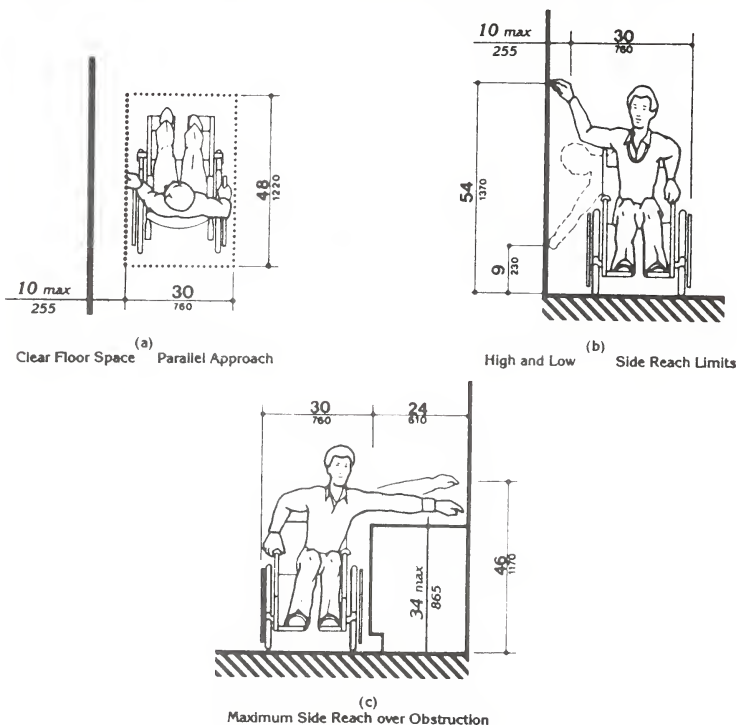


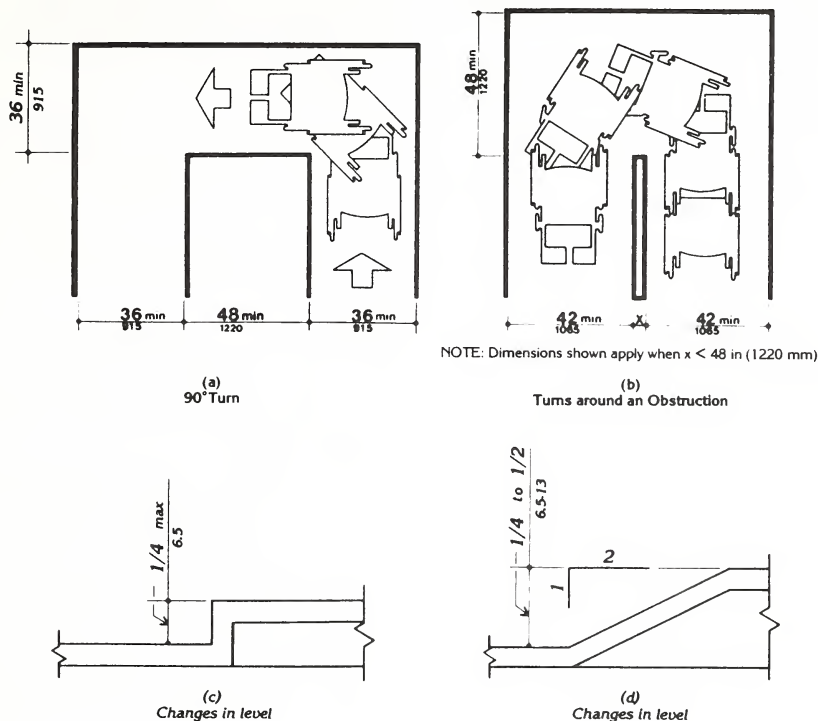
Fig. 6  
Side Reach

**4.3.7 Slope.** An accessible route with a running slope greater than 1:20 is a ramp and shall comply with 4.8. Nowhere shall the cross slope of an accessible route exceed 1:50.

**4.3.8 Changes in Levels.** Changes in levels along an accessible route shall comply with 4.5.2. If an accessible route has changes in level greater than 1/2 in (13 mm), then a curb

ramp, ramp, elevator, or platform lift (as permitted in 4.1.3 and 4.1.6) shall be provided that complies with 4.7, 4.8, 4.10, or 4.11, respectively. An accessible route does not include stairs, steps, or escalators. See definition of "egress, means of" in 3.5.

**4.3.9 Doors.** Doors along an accessible route shall comply with 4.13.

**4.3.10\* Egress**

**Fig. 7**  
**Accessible Route**

**4.3.10\* Egress.** Accessible routes serving any accessible space or element shall also serve as a means of egress for emergencies or connect to an accessible area of rescue assistance.

**4.3.11 Areas of Rescue Assistance.**

**4.3.11.1 Location and Construction.** An area of rescue assistance shall be one of the following:

(1) A portion of a stairway landing within a smokeproof enclosure (complying with local requirements).

(2) A portion of an exterior exit balcony located immediately adjacent to an exit stairway when the balcony complies with local requirements for exterior exit balconies. Openings to the interior of the building located within 20 feet (6 m) of the

#### 4.4 Protruding Objects

area of rescue assistance shall be protected with fire assemblies having a three-fourths hour fire protection rating.

(3) A portion of a one-hour fire-resistive corridor (complying with local requirements for fire-resistive construction and for openings) located immediately adjacent to an exit enclosure.

(4) A vestibule located immediately adjacent to an exit enclosure and constructed to the same fire-resistive standards as required for corridors and openings.

(5) A portion of a stairway landing within an exit enclosure which is vented to the exterior and is separated from the interior of the building with not less than one-hour fire-resistive doors.

(6) When approved by the appropriate local authority, an area or a room which is separated from other portions of the building by a smoke barrier. Smoke barriers shall have a fire-resistive rating of not less than one hour and shall completely enclose the area or room. Doors in the smoke barrier shall be tight-fitting smoke- and draft-control assemblies having a fire-protection rating of not less than 20 minutes and shall be self-closing or automatic closing. The area or room shall be provided with an exit directly to an exit enclosure. Where the room or area exits into an exit enclosure which is required to be of more than one-hour fire-resistive construction, the room or area shall have the same fire-resistive construction, including the same opening protection, as required for the adjacent exit enclosure.

(7) An elevator lobby when elevator shafts and adjacent lobbies are pressurized as required for smokeproof enclosures by local regulations and when complying with requirements herein for size, communication, and signage. Such pressurization system shall be activated by smoke detectors on each floor located in a manner approved by the appropriate local authority. Pressurization equipment and its duct work within the building shall be separated from other portions of the building by a minimum two-hour fire-resistive construction.

**4.3.11.2 Size.** Each area of rescue assistance shall provide at least two accessible areas each being not less than 30 inches by 48 inches (760 mm by 1220 mm). The area of rescue

assistance shall not encroach on any required exit width. The total number of such 30-inch by 48-inch (760 mm by 1220 mm) areas per story shall be not less than one for every 200 persons of calculated occupant load served by the area of rescue assistance.

**EXCEPTION:** The appropriate local authority may reduce the minimum number of 30-inch by 48-inch (760 mm by 1220 mm) areas to one for each area of rescue assistance on floors where the occupant load is less than 200.

**4.3.11.3\* Stairway Width.** Each stairway adjacent to an area of rescue assistance shall have a minimum clear width of 48 inches between handrails.

**4.3.11.4\* Two-way Communication.** A method of two-way communication, with both visible and audible signals, shall be provided between each area of rescue assistance and the primary entry. The fire department or appropriate local authority may approve a location other than the primary entry.

**4.3.11.5 Identification.** Each area of rescue assistance shall be identified by a sign which states "AREA OF RESCUE ASSISTANCE" and displays the international symbol of accessibility. The sign shall be illuminated when exit sign illumination is required. Signage shall also be installed at all inaccessible exits and where otherwise necessary to clearly indicate the direction to areas of rescue assistance. In each area of rescue assistance, instructions on the use of the area under emergency conditions shall be posted adjoining the two-way communication system.

#### 4.4 Protruding Objects.

**4.4.1\* General.** Objects projecting from walls (for example, telephones) with their leading edges between 27 in and 80 in (685 mm and 2030 mm) above the finished floor shall protrude no more than 4 in (100 mm) into walks, halls, corridors, passageways, or aisles (see Fig. 8(a)). Objects mounted with their leading edges at or below 27 in (685 mm) above the finished floor may protrude any amount (see Fig. 8(a) and (b)). Free-standing objects mounted on posts or pylons may overhang 12 in (305 mm) maximum from 27 in to 80 in (685 mm to 2030 mm) above the ground or

#### 4.4 Protruding Objects

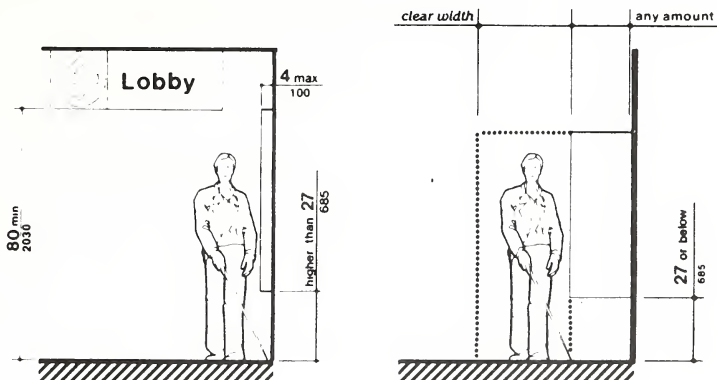


Fig. 8 (a)  
Walking Parallel to a Wall

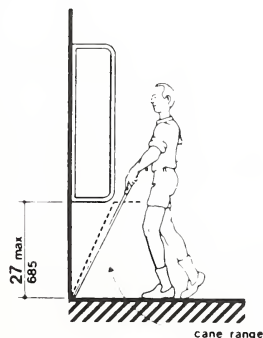


Fig. 8 (b)  
Walking Perpendicular to a Wall

Fig. 8  
Protruding Objects

finished floor (see Fig. 8(c) and (d)). Protruding objects shall not reduce the clear width of an accessible route or maneuvering space (see Fig. 8(e)).

**4.4.2 Head Room.** Walks, halls, corridors, passageways, aisles, or other circulation spaces shall have 80 in (2030 mm) minimum clear head room (see Fig. 8(a)). *If vertical clearance of an area adjoining an accessible route is reduced to less than 80 in (nominal dimension), a barrier to warn blind or visually-impaired persons shall be provided (see Fig. 8(c-1)).*

#### 4.5 Ground and Floor Surfaces.

**4.5.1\* General.** Ground and floor surfaces along accessible routes and in accessible rooms and spaces including floors, walks, ramps, stairs, and curb ramps, shall be stable, firm, slip-resistant, and shall comply with 4.5.

**4.5.2 Changes in Level.** Changes in level up to 1/4 in (6 mm) may be vertical and without edge treatment (see Fig. 7(c)). Changes in level between 1/4 in and 1/2 in (6 mm and 13 mm)

## 4.4 Protruding Objects

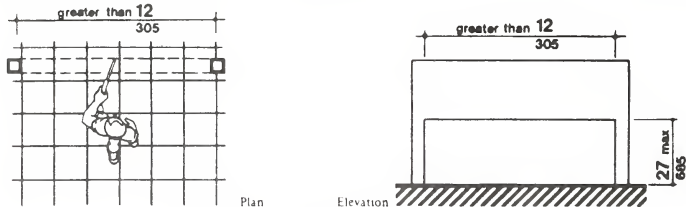


Fig. 8 (c) Free-Standing Overhanging Objects

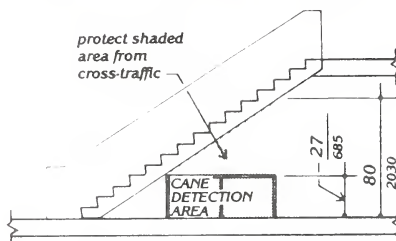
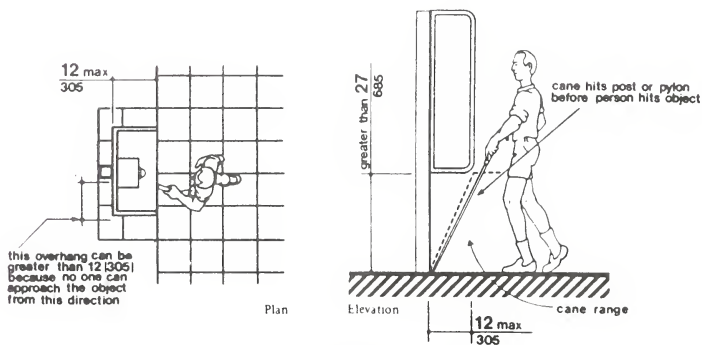


Fig. 8 (c-1) Overhead Hazards

Fig. 8 (d)  
Objects Mounted on Posts or PylonsFig. 8  
Protruding Objects (Continued)

## 4.5 Ground and Floor Surfaces

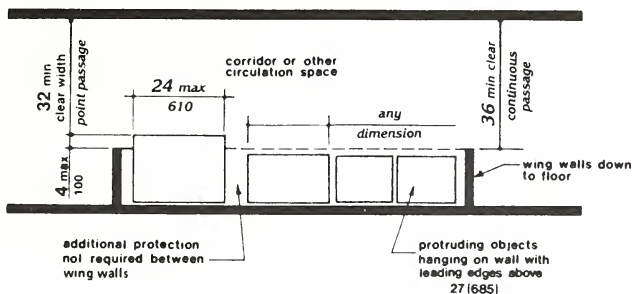


Fig. 8 (e)

Example of Protection around Wall-Mounted Objects and Measurements of Clear Widths

Fig. 8  
Protruding Objects (Continued)

shall be beveled with a slope no greater than 1:2 (see Fig. 7(d)). Changes in level greater than 1/2 in (13 mm) shall be accomplished by means of a ramp that complies with 4.7 or 4.8.

**4.5.3\* Carpet.** If carpet or carpet tile is used on a ground or floor surface, then it shall be securely attached; have a firm cushion, pad, or backing, or no cushion or pad; and have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum pile thickness shall be 1/2 in (13 mm) (see Fig. 8(f)). Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim shall comply with 4.5.2.

**4.5.4 Gratings.** If gratings are located in walking surfaces, then they shall have spaces no greater than 1/2 in (13 mm) wide in one direction (see Fig. 8(g)). If gratings have elongated openings, then they shall be placed so that the long dimension is perpendicular to the dominant direction of travel (see Fig. 8(h)).

## 4.6 Parking and Passenger Loading Zones.

**4.6.1 Minimum Number.** Parking spaces required to be accessible by 4.1 shall comply with 4.6.2 through 4.6.5. Passenger loading zones required to be accessible by 4.1 shall comply with 4.6.5 and 4.6.6.

## 4.6 Parking and Passenger Loading Zones

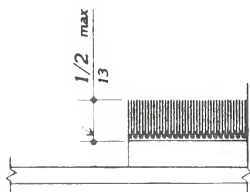


Fig. 8 (f)  
Carpet Pile Thickness

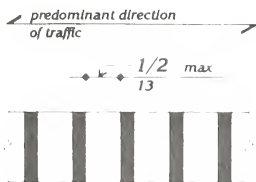


Fig. 8 (g)  
Gratings

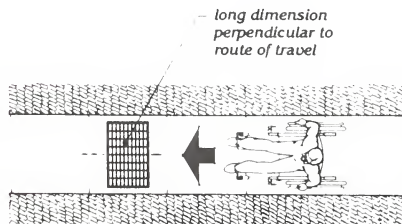


Fig. 8 (h)  
Grating Orientation

**4.6.2 Location.** Accessible parking spaces serving a particular building shall be located on the shortest accessible route of travel from adjacent parking to an accessible entrance. In parking facilities that do not serve a particular building, accessible parking shall be located on the shortest accessible route of travel to an accessible pedestrian entrance of the parking facility. In buildings with multiple accessible entrances with adjacent parking, accessible parking spaces shall be dispersed and located closest to the accessible entrances.

**4.6.3\* Parking Spaces.** Accessible parking spaces shall be at least 96 in (2440 mm) wide. Parking access aisles shall be part of an accessible route to the building or facility entrance and shall comply with 4.3. Two accessible parking spaces may share a common access aisle (see Fig. 9). Parked vehicle overhangs shall not reduce the clear width of an accessible route. Parking spaces and access aisles shall be level with surface slopes not exceeding 1:50 (2%) in all directions.

**4.6.4\* Signage.** Accessible parking spaces shall be designated as reserved by a sign showing the symbol of accessibility (see 4.30.7). Spaces complying with 4.1.2(5)(b) shall have an additional sign "Van-Accessible" mounted below the symbol of accessibility. Such signs shall be located so they cannot be obscured by a vehicle parked in the space.

**4.6.5\* Vertical Clearance.** Provide minimum vertical clearance of 114 in (2895 mm) at accessible passenger loading zones and along at least one vehicle access route to such areas from site entrance(s) and exit(s). At parking spaces complying with 4.1.2(5)(b), provide minimum vertical clearance of 98 in (2490 mm) at the parking space and along at least one vehicle access route to such spaces from site entrance(s) and exit(s).

**4.6.6 Passenger Loading Zones.** Passenger loading zones shall provide an access aisle at least 60 in (1525 mm) wide and 20 ft (240 in) (6100 mm) long adjacent and parallel to the vehicle pull-up space (see Fig. 10). If there are curbs between the access aisle and the vehicle pull-up space, then a curb ramp complying with 4.7 shall be provided. Vehicle standing spaces and access aisles shall be level with



## 4.7 Curb Ramps

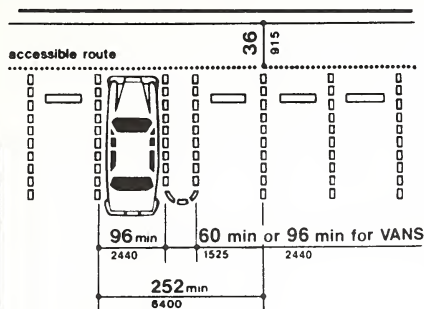


Fig. 9  
Dimensions of Parking Spaces

surface slopes not exceeding 1:50 (2%) in all directions.

### 4.7 Curb Ramps.

**4.7.1 Location.** Curb ramps complying with 4.7 shall be provided wherever an accessible route crosses a curb.

**4.7.2 Slope.** Slopes of curb ramps shall comply with 4.8.2. The slope shall be measured as shown in Fig. 11. *Transitions from ramps to walks, gutters, or streets shall be flush and free of abrupt changes. Maximum slopes of adjoining gutters, road surface immediately adjacent to the curb ramp, or accessible route shall not exceed 1:20.*

**4.7.3 Width.** The minimum width of a curb ramp shall be 36 in (915 mm), exclusive of flared sides.

**4.7.4 Surface.** Surfaces of curb ramps shall comply with 4.5.

**4.7.5 Sides of Curb Ramps.** If a curb ramp is located where pedestrians must walk across the ramp, or where it is not protected by handrails or guardrails, it shall have flared sides; the maximum slope of the flare shall be 1:10 (see Fig. 12(a)). Curb ramps with returned curbs

may be used where pedestrians would not normally walk across the ramp (see Fig. 12(b)).

**4.7.6 Built-up Curb Ramps.** Built-up curb ramps shall be located so that they do not project into vehicular traffic lanes (see Fig. 13).

**4.7.7 Detectable Warnings.** A curb ramp shall have a detectable warning complying with 4.29.2. *The detectable warning shall extend the full width and depth of the curb ramp.*

**4.7.8 Obstructions.** Curb ramps shall be located or protected to prevent their obstruction by parked vehicles.

**4.7.9 Location at Marked Crossings.** Curb ramps at marked crossings shall be wholly contained within the markings, excluding any flared sides (see Fig. 15).

**4.7.10 Diagonal Curb Ramps.** If diagonal (or corner type) curb ramps have returned curbs or other well-defined edges, such edges shall be parallel to the direction of pedestrian flow. The bottom of diagonal curb ramps shall have 48 in (1220 mm) minimum clear space as shown in Fig. 15(c) and (d). If diagonal curb ramps are provided at marked crossings, the 48 in (1220 mm) clear space shall be within the markings (see Fig. 15(c) and (d)). If diagonal curb ramps have flared sides, they shall also have at least a 24 in (610 mm) long segment of straight curb located on each side of the curb ramp and within the marked crossing (see Fig. 15(c)).

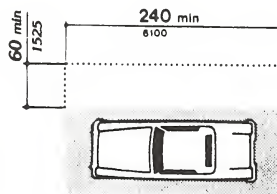


Fig. 10  
Access Aisle at Passenger Loading Zones



## 4.8 Ramps

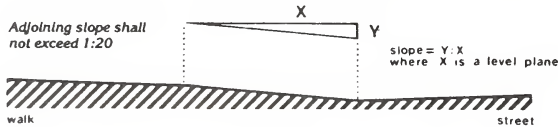
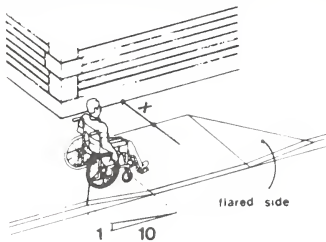
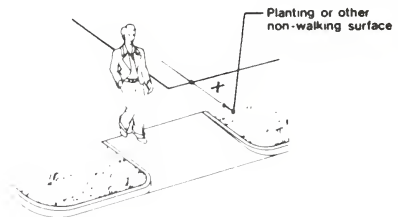


Fig. 11  
Measurement of Curb Ramp Slopes



(a)  
Flared Sides

*If X is less than 48 in,  
then the slope of the flared side  
shall not exceed 1:12.*



(b)  
Returned Curb

Fig. 12  
Sides of Curb Ramps

**4.7.11 Islands.** Any raised islands in crossings shall be cut through level with the street and have curb ramps at both sides and a level area at least 48 in (1220 mm) long between the curb ramps in the part of the island intersected by the crossings (see Fig. 15(a) and (b)).

#### 4.8 Ramps.

**4.8.1\* General.** Any part of an accessible route with a slope greater than 1:20 shall be considered a ramp and shall comply with 4.8.

**4.8.2\* Slope and Rise.** The least possible slope shall be used for any ramp. The maximum slope of a ramp in new construction shall be 1:12. The maximum rise for any run shall be 30 in (760 mm) (see Fig. 16). Curb ramps



Fig. 13  
Built-Up Curb Ramp

and ramps to be constructed on existing sites or in existing buildings or facilities may have slopes and rises as allowed in 4.1.6(3)(a) if space limitations prohibit the use of a 1:12 slope or less.

## 4.8 Ramps

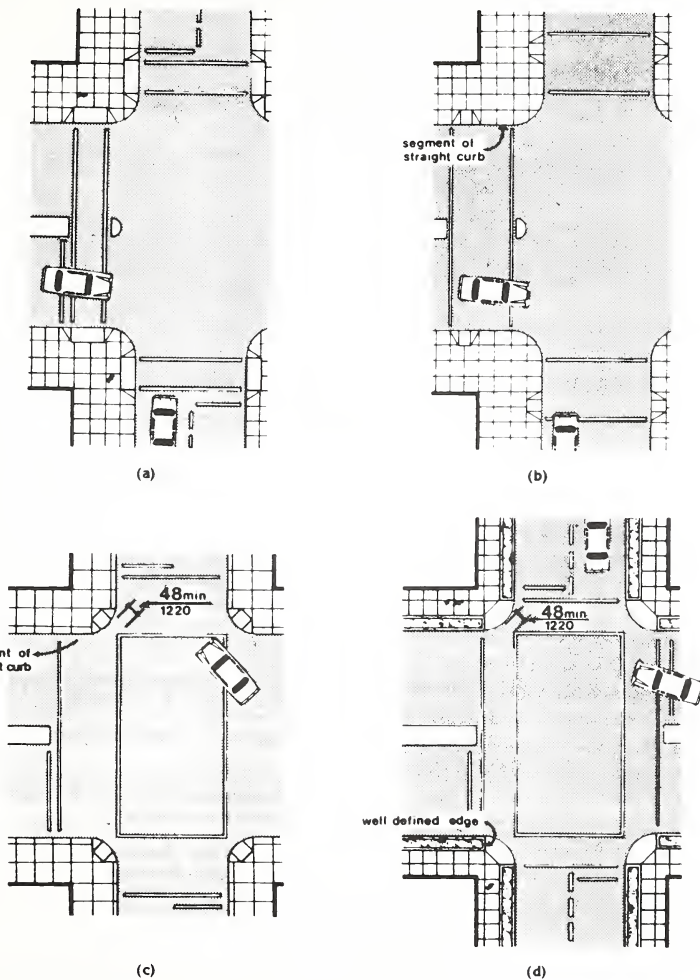
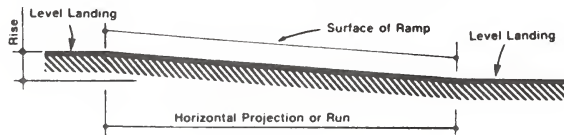


Fig. 15  
Curb Ramps at Marked Crossings

## 4.8 Ramps



Slope	Maximum Rise		Maximum Horizontal Projection	
	in	mm	ft	m
1:12 to < 1:16	30	760	30	9
1:16 to < 1:20	30	760	40	12

Fig. 16  
Components of a Single Ramp Run and Sample Ramp Dimensions

**4.8.3 Clear Width.** The minimum clear width of a ramp shall be 36 in (915 mm).

**4.8.4\* Landings.** Ramps shall have level landings at bottom and top of *each ramp and each ramp run*. Landings shall have the following features:

- (1) The landing shall be at least as wide as the ramp run leading to it.
- (2) The landing length shall be a minimum of 60 in (1525 mm) clear.
- (3) If ramps change direction at landings, the minimum landing size shall be 60 in by 60 in (1525 mm by 1525 mm).
- (4) If a doorway is located at a landing, then the area in front of the doorway shall comply with 4.13.6.

**4.8.5\* Handrails.** If a ramp run has a rise greater than 6 in (150 mm) or a horizontal projection greater than 72 in (1830 mm), then it shall have handrails on both sides. Handrails are not required on curb ramps or *adjacent to seating in assembly areas*. Handrails shall comply with 4.26 and shall have the following features:

(1) Handrails shall be provided along both sides of ramp segments. The inside handrail on switchback or dogleg ramps shall always be continuous.

(2) If handrails are not continuous, they shall extend at least 12 in (305 mm) beyond the top and bottom of the ramp segment and shall be parallel with the floor or ground surface (see Fig. 17).

(3) The clear space between the handrail and the wall shall be 1 - 1/2 in (38 mm).

(4) Gripping surfaces shall be continuous.

(5) *Top of handrail gripping surfaces shall be mounted between 34 in and 38 in (865 mm and 965 mm) above ramp surfaces.*

(6) *Ends of handrails shall be either rounded or returned smoothly to floor, wall, or post.*

(7) *Handrails shall not rotate within their fittings.*

**4.8.6 Cross Slope and Surfaces.** The cross slope of ramp surfaces shall be no greater than 1:50. Ramp surfaces shall comply with 4.5.

## 4.9 Stairs

**4.8.7 Edge Protection.** Ramps and landings with drop-offs shall have curbs, walls, railings, or projecting surfaces that prevent people from slipping off the ramp. Curbs shall be a minimum of 2 in (50 mm) high (see Fig. 17).

**4.8.8 Outdoor Conditions.** Outdoor ramps and their approaches shall be designed so that water will not accumulate on walking surfaces.

## 4.9 Stairs.

**4.9.1\* Minimum Number.** *Stairs required to be accessible by 4.1 shall comply with 4.9.*

**4.9.2 Treads and Risers.** On any given flight of stairs, all steps shall have uniform riser heights and uniform tread widths. Stair treads shall be no less than 11 in (280 mm) wide, measured from riser to riser (see Fig. 18(a)). *Open risers are not permitted.*

**4.9.3 Nosings.** The undersides of nosings shall not be abrupt. The radius of curvature at the leading edge of the tread shall be no greater than 1/2 in (13 mm). Risers shall be sloped or the underside of the nosing shall have an angle not less than 60 degrees from the horizontal. Nosings shall project no more than 1-1/2 in (38 mm) (see Fig. 18).

**4.9.4 Handrails.** Stairways shall have handrails at both sides of all stairs. Handrails shall comply with 4.26 and shall have the following features:

(1) Handrails shall be continuous along both sides of stairs. The inside handrail on switchback or dogleg stairs shall always be continuous (see Fig. 19(a) and (b)).

(2) If handrails are not continuous, they shall extend at least 12 in (305 mm) beyond the top riser and at least 12 in (305 mm) plus the width of one tread beyond the bottom riser. At the top, the extension shall be parallel with the floor or ground surface. At the bottom, the handrail shall continue to slope for a distance of the width of one tread from the bottom riser; the remainder of the extension shall be horizontal (see Fig. 19(c) and (d)). Handrail extensions shall comply with 4.4.

(3) The clear space between handrails and wall shall be 1-1/2 in (38 mm).

(4) Gripping surfaces shall be uninterrupted by newel posts, other construction elements, or obstructions.

(5) *Top of handrail gripping surface shall be mounted between 34 in and 38 in (865 mm and 965 mm) above stair nosings.*

(6) *Ends of handrails shall be either rounded or returned smoothly to floor, wall or post.*

(7) *Handrails shall not rotate within their fittings.*

**4.9.5 Detectable Warnings at Stairs.** *(Reserved).*

**4.9.6 Outdoor Conditions.** Outdoor stairs and their approaches shall be designed so that water will not accumulate on walking surfaces.

## 4.10 Elevators.

**4.10.1 General.** Accessible elevators shall be on an accessible route and shall comply with 4.10 and with the ASME A17.1-1990, Safety Code for Elevators and Escalators. *Freight elevators shall not be considered as meeting the requirements of this section unless the only elevators provided are used as combination passenger and freight elevators for the public and employees.*

**4.10.2 Automatic Operation.** Elevator operation shall be automatic. Each car shall be equipped with a self-leveling feature that will automatically bring the car to floor landings within a tolerance of 1/2 in (13 mm) under rated loading to zero loading conditions. This self-leveling feature shall be automatic and independent of the operating device and shall correct the overtravel or undertavel.

**4.10.3 Hall Call Buttons.** Call buttons in elevator lobbies and halls shall be centered at 42 in (1065 mm) above the floor. Such call buttons shall have visual signals to indicate when each call is registered and when each call is answered. Call buttons shall be a minimum of 3/4 in (19 mm) in the smallest dimension. The button designating the up direction shall be on top. (See Fig. 20.) *Buttons shall be raised or flush. Objects mounted beneath hall call buttons shall not project into the elevator lobby more than 4 in (100 mm).*

## 4.10 Elevators

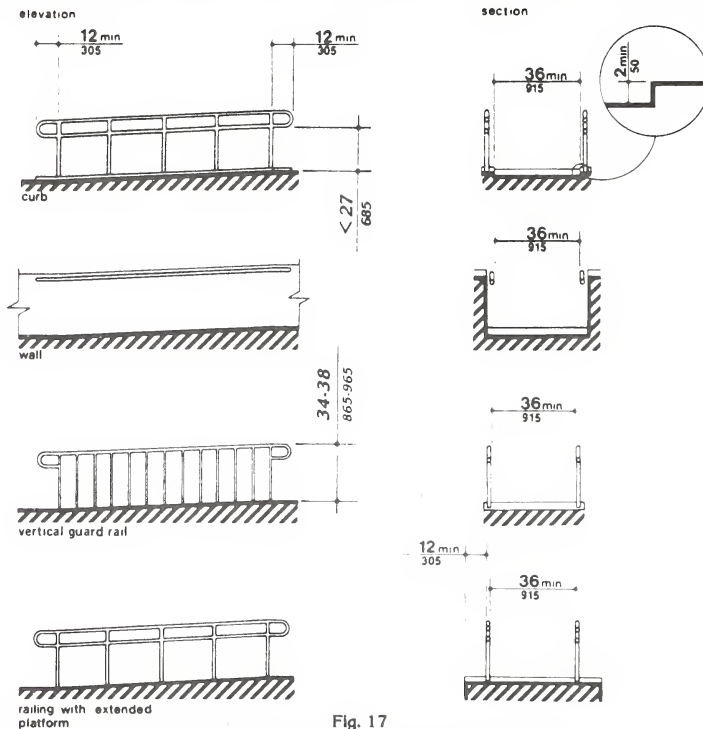


Fig. 17

Examples of Edge Protection and Handrail Extensions

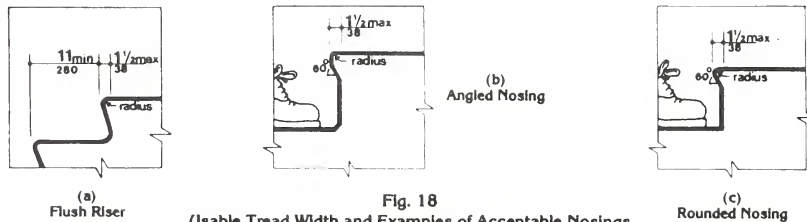
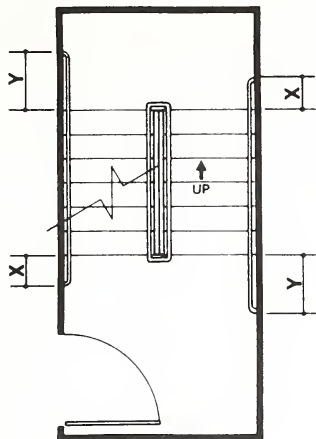
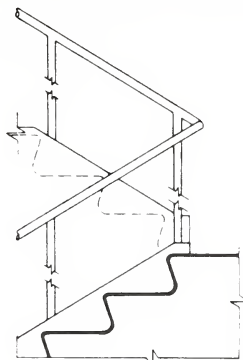
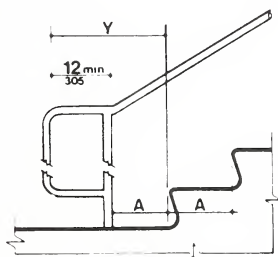
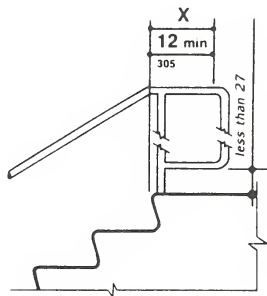


Fig. 18

Usable Tread Width and Examples of Acceptable Nosings

## 4.10 Elevators

(a)  
Plan(b)  
Elevation of Center Handrail(c)  
Extension at Bottom of Run(d)  
Extension at Top of Run**NOTE:**

*X is the 12 in minimum handrail extension required at each top riser.*

*Y is the minimum handrail extension of 12 in plus the width of one tread that is required at each bottom riser.*

**Fig. 19**  
**Stair Handrails**





#### 4.10.12 Car Controls

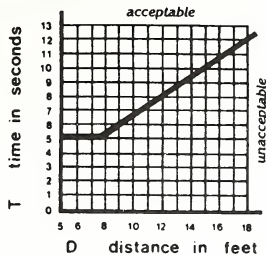


Fig. 21

Graph of Timing Equation

within reach of controls, and exit from the car. Acceptable door opening and inside dimensions shall be as shown in Fig. 22. The clearance between the car platform sill and the edge of any hoistway landing shall be no greater than 1-1/4 in (32 mm).

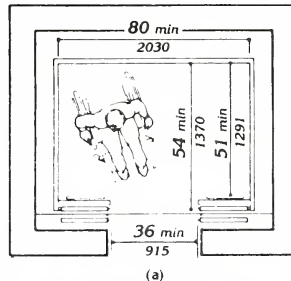
**4.10.10 Floor Surfaces.** Floor surfaces shall comply with 4.5.

**4.10.11 Illumination Levels.** The level of illumination at the car controls, platform, and car threshold and landing sill shall be at least 5 footcandles (53.8 lux).

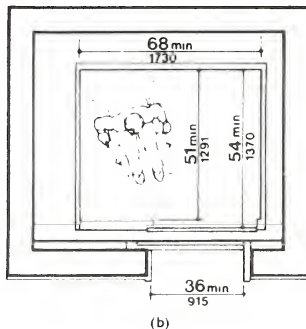
**4.10.12\* Car Controls.** Elevator control panels shall have the following features:

(1) Buttons. All control buttons shall be at least 3/4 in (19 mm) in their smallest dimension. They shall be *raised* or *flush*.

(2) Tactile, Braille, and Visual Control Indicators. All control buttons shall be designated by *Braille* and by *raised* standard alphabet characters for letters, arabic characters for numerals, or standard symbols as shown in Fig. 23(a), and as required in ASME A17.1-1990. *Raised* and *Braille* characters and symbols shall comply with 4.30. The call button for the main entry floor shall be designated by a *raised* star at the left of the floor designation (see Fig. 23(a)). All raised designations for control buttons shall be placed immediately to the left of the button to which they apply. Applied plates,



(a)



(b)

Fig. 22

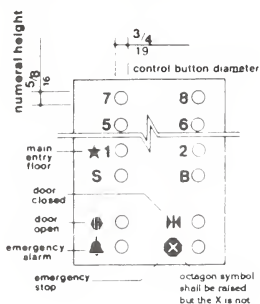
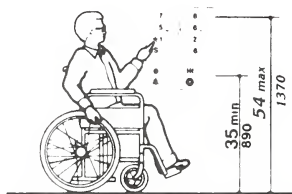
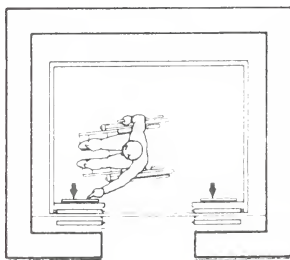
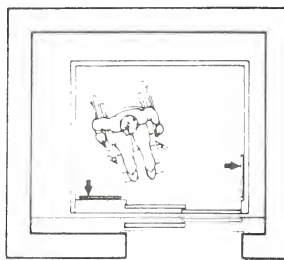
Minimum Dimensions of Elevator Cars

permanently attached, are an acceptable means to provide raised control designations. Floor buttons shall be provided with visual indicators to show when each call is registered. The visual indicators shall be extinguished when each call is answered.

(3) Height. All floor buttons shall be no higher than 54 in (1370 mm) above the *finish floor for side approach* and 48 in (1220 mm) for *front approach*. Emergency controls, including the emergency alarm and emergency stop, shall be grouped at the bottom of the panel and shall have their centerlines no less than 35 in (890 mm) above the finish floor (see Fig. 23(a) and (b)).



## 4.10.13\* Car Position Indicators

(a)  
Panel Detail(b)  
Car Control Height(c)  
Alternate Locations of Panel  
with Center Opening Door(d)  
Alternate Locations of Panel  
with Side Opening DoorFig. 23  
Car Controls

(4) Location. Controls shall be located on a front wall if cars have center opening doors, and at the side wall or at the front wall next to the door if cars have side opening doors (see Fig. 23(c) and (d)).

**4.10.13\* Car Position Indicators.** In elevator cars, a visual car position indicator shall be provided above the car control panel or over the door to show the position of the elevator in the hoistway. As the car passes or stops at a floor served by the elevators, the corresponding numerals shall illuminate,

and an audible signal shall sound. Numerals shall be a minimum of 1/2 in (13 mm) high. The audible signal shall be no less than 20 decibels with a frequency no higher than 1500 Hz. An automatic verbal announcement of the floor number at which a car stops or which a car passes may be substituted for the audible signal.

**4.10.14\* Emergency Communications.** If provided, emergency two-way communication systems between the elevator and a point outside the hoistway shall comply with ASME

#### 4.11 Platform Lifts (Wheelchair Lifts)

*A17.1-1990. The highest operable part of a two-way communication system shall be a maximum of 48 in (1220 mm) from the floor of the car. It shall be identified by a raised symbol and lettering complying with 4.30 and located adjacent to the device. If the system uses a handset then the length of the cord from the panel to the handset shall be at least 29 in (735 mm). If the system is located in a closed compartment the compartment door hardware shall conform to 4.27, Controls and Operating Mechanisms. The emergency inter-communication system shall not require voice communication.*

##### 4.11 Platform Lifts (Wheelchair Lifts).

**4.11.1 Location.** Platform lifts (wheelchair lifts) permitted by 4.1 shall comply with the requirements of 4.11.

**4.11.2\* Other Requirements.** If platform lifts (wheelchair lifts) are used, they shall comply with 4.2.4, 4.5, 4.27, and ASME A17.1 Safety Code for Elevators and Escalators, Section XX, 1990.

**4.11.3 Entrance.** If platform lifts are used then they shall facilitate unassisted entry, operation, and exit from the lift in compliance with 4.11.2.

##### 4.12 Windows.

**4.12.1\* General.** (Reserved).

**4.12.2\* Window Hardware.** (Reserved).

##### 4.13 Doors.

**4.13.1 General.** Doors required to be accessible by 4.1 shall comply with the requirements of 4.13.

##### 4.13.2 Revolving Doors and Turnstiles.

Revolving doors or turnstiles shall not be the only means of passage at an accessible entrance or along an accessible route. An accessible gate or door shall be provided adjacent to the turnstile or revolving door and shall be so designed as to facilitate the same use pattern.

**4.13.3 Gates.** Gates, including ticket gates, shall meet all applicable specifications of 4.13.

**4.13.4 Double-Leaf Doorways.** If doorways have two *independently operated* door leaves, then at least one leaf shall meet the specifications in 4.13.5 and 4.13.6. That leaf shall be an active leaf.

**4.13.5 Clear Width.** Doorways shall have a minimum clear opening of 32 in (815 mm) with the door open 90 degrees, measured between the face of the door and the *opposite* stop (see Fig. 24(a), (b), (c), and (d)). Openings more than 24 in (610 mm) in depth shall comply with 4.2.1 and 4.3.3 (see Fig. 24(e)).

*EXCEPTION: Doors not requiring full user passage, such as shallow closets, may have the clear opening reduced to 20 in (510 mm) minimum.*

##### 4.13.6 Maneuvering Clearances at

**Doors.** Minimum maneuvering clearances at doors that are not automatic or power-assisted shall be as shown in Fig. 25. The floor or ground area within the required clearances shall be level and clear.

*EXCEPTION: Entry doors to acute care hospital bedrooms for in-patients shall be exempted from the requirement for space at the latch side of the door (see dimension "x" in Fig. 25) if the door is at least 44 in (1120 mm) wide.*

**4.13.7 Two Doors in Series.** The minimum space between two hinged or pivoted doors in series shall be 48 in (1220 mm) plus the width of any door swinging into the space. Doors in series shall swing either in the same direction or away from the space between the doors (see Fig. 26).

##### 4.13.8\* Thresholds at Doorways.

Thresholds at doorways shall not exceed 3/4 in (19 mm) in height for exterior sliding doors or 1/2 in (13 mm) for other types of doors. Raised thresholds and floor level changes at accessible doorways shall be beveled with a slope no greater than 1:2 (see 4.5.2).

**4.13.9\* Door Hardware.** Handles, pulls, latches, locks, and other operating devices on accessible doors shall have a shape that is easy

## 4.13 Doors

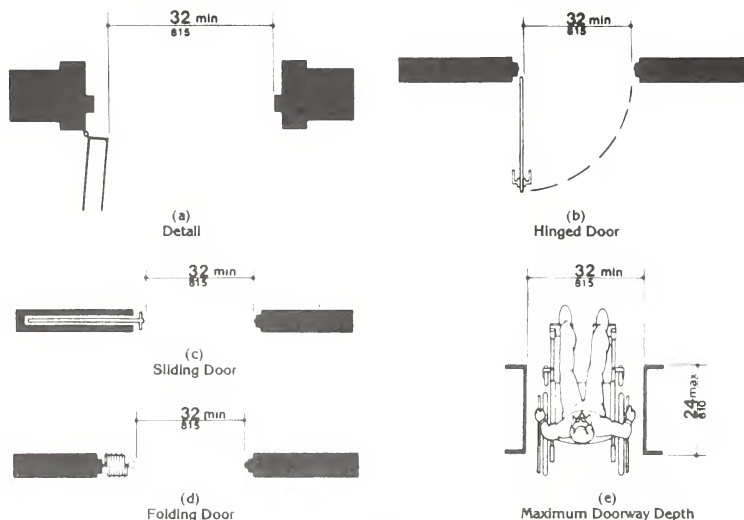


Fig. 24  
Clear Doorway Width and Depth

to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate. Lever-operated mechanisms, push-type mechanisms, and U-shaped handles are acceptable designs. When sliding doors are fully open, operating hardware shall be exposed and usable from both sides. *Hardware required for accessible door passage shall be mounted no higher than 48 in (1220 mm) above finished floor.*

**4.13.10\* Door Closers.** If a door has a closer, then the sweep period of the closer shall be adjusted so that from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 in (75 mm) from the latch, measured to the leading edge of the door.

**4.13.11\* Door Opening Force.** The maximum force for pushing or pulling open a door shall be as follows:

(1) Fire doors shall have the minimum opening force allowable by the appropriate administrative authority.

(2) Other doors.

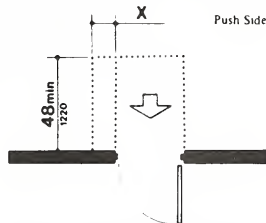
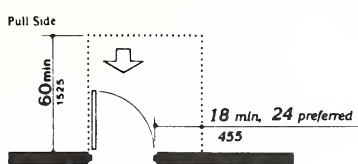
(a) exterior hinged doors: *(Reserved)*.

(b) interior hinged doors: 5 lbf (22.2N)

(c) sliding or folding doors: 5 lbf (22.2N)

These forces do not apply to the force required to retract latch bolts or disengage other devices that may hold the door in a closed position.

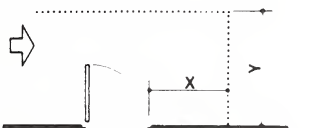
## 4.13 Doors



NOTE: x = 12 in (305 mm) if door has both a closer and latch.

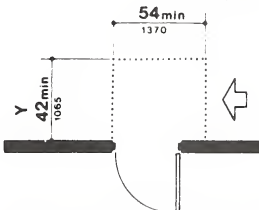
(a)  
Front Approaches — Swinging Doors

Pull Side



NOTE: x = 36 in (915 mm) minimum if y = 60 in (1525 mm); x = 42 in (1065 mm) minimum if y = 54 in (1370 mm).

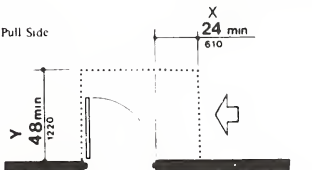
Push Side



NOTE: y = 48 in (1220 mm) minimum if door has both a latch and closer.

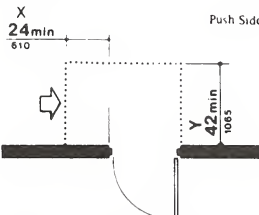
(b)  
Hinge Side Approaches — Swinging Doors

Pull Side



NOTE: y = 54 in (1370 mm) minimum if door has closer.

Push Side



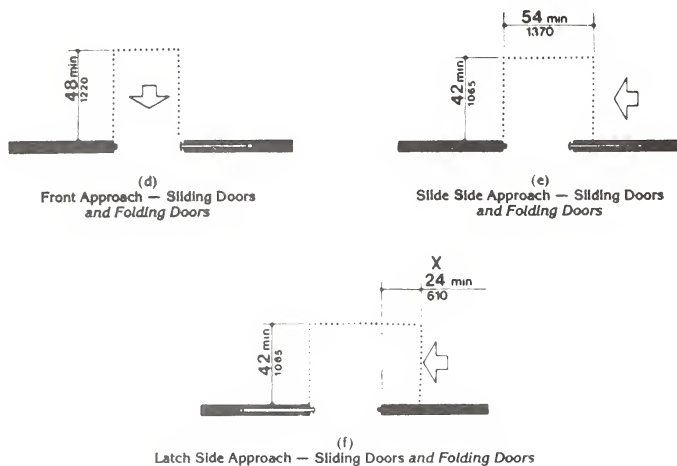
NOTE: y = 48 in (1220 mm) minimum if door has closer.

(c)  
Latch Side Approaches — Swinging Doors

NOTE: All doors in alcoves shall comply with the clearances for front approaches.

Fig. 25  
Maneuvering Clearances at Doors

## 4.13 Doors



NOTE: All doors in alcoves shall comply with the clearances for front approaches.

Fig. 25  
Maneuvering Clearances at Doors (Continued)

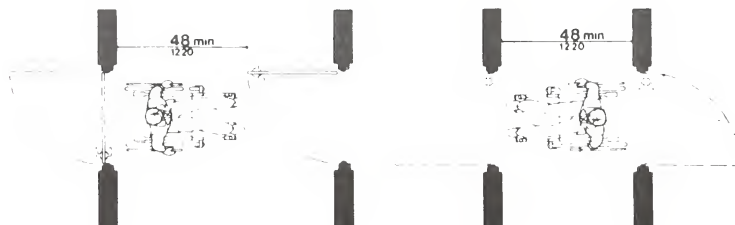


Fig. 26  
Two Hinged Doors in Series

## 4.14 Entrances

### 4.13.12\* Automatic Doors and Power-Assisted Doors.

If an automatic door is used, then it shall comply with *ANSI/BHMA A156.10-1985*. Slowly opening, low-powered, automatic doors shall comply with *ANSI A156.19-1984*. Such doors shall not open to back check faster than 3 seconds and shall require no more than 15 lbf (66.6N) to stop door movement. If a power-assisted door is used, its door-opening force shall comply with 4.13.11 and its closing shall conform to the requirements in *ANSI A156.19-1984*.

## 4.14 Entrances.

### 4.14.1 Minimum Number.

*Entrances required to be accessible by 4.1* shall be part of an accessible route complying with 4.3. Such entrances shall be connected by an accessible route to public transportation stops, to accessible parking and passenger loading zones, and to public streets or sidewalks if available (see 4.3.2(1)). They shall also be connected by an accessible route to all accessible spaces or elements within the building or facility.

### 4.14.2 Service Entrances.

A service entrance shall not be the sole accessible entrance unless it is the only entrance to a building or facility (for example, in a factory or garage).

## 4.15 Drinking Fountains and Water Coolers.

**4.15.1 Minimum Number.** *Drinking fountains or water coolers required to be accessible by 4.1* shall comply with 4.15.

**4.15.2\* Spout Height.** Spouts shall be no higher than 36 in (915 mm), measured from the floor or ground surfaces to the spout outlet (see Fig. 27(a)).

**4.15.3 Spout Location.** The spouts of drinking fountains and water coolers shall be at the front of the unit and shall direct the water flow in a trajectory that is parallel or nearly parallel to the front of the unit. The spout shall provide a flow of water at least 4 in (100 mm) high so as to allow the insertion of a cup or glass under the flow of water. *On an accessible drinking fountain with a round or*

*oval bowl, the spout must be positioned so the flow of water is within 3 in (75 mm) of the front edge of the fountain.*

**4.15.4 Controls.** Controls shall comply with 4.27.4. *Unit controls shall be front mounted or side mounted near the front edge.*

### 4.15.5 Clearances.

(1) Wall- and post-mounted cantilevered units shall have a clear knee space between the bottom of the apron and the floor or ground at least 27 in (685 mm) high, 30 in (760 mm) wide, and 17 in to 19 in (430 mm to 485 mm) deep (see Fig. 27(a) and (b)). Such units shall also have a minimum clear floor space 30 in by 48 in (760 mm by 1220 mm) to allow a person in a wheelchair to approach the unit facing forward.

(2) Free-standing or built-in units not having a clear space under them shall have a clear floor space at least 30 in by 48 in (760 mm by 1220 mm) that allows a person in a wheelchair to make a parallel approach to the unit (see Fig. 27(c) and (d)). This clear floor space shall comply with 4.2.4.

## 4.16 Water Closets.

**4.16.1 General.** Accessible water closets shall comply with 4.16.

**4.16.2 Clear Floor Space.** Clear floor space for water closets not in stalls shall comply with Fig. 28. Clear floor space may be arranged to allow either a left-handed or right-handed approach.

**4.16.3\* Height.** The height of water closets shall be 17 in to 19 in (430 mm to 485 mm), measured to the top of the toilet seat (see Fig. 29(b)). *Seats shall not be sprung to return to a lifted position.*

**4.16.4\* Grab Bars.** Grab bars for water closets not located in stalls shall comply with 4.26 and Fig. 29. *The grab bar behind the water closet shall be 36 in (915 mm) minimum.*

**4.16.5\* Flush Controls.** Flush controls shall be hand operated or automatic and shall comply with 4.27.4. Controls for flush valves

## 4.17 Toilet Stalls

shall be mounted on the wide side of toilet areas no more than 44 in (1120 mm) above the floor.

**4.16.6 Dispensers.** Toilet paper dispensers shall be installed within reach, as shown in Fig. 29(b). *Dispensers that control delivery, or that do not permit continuous paper flow, shall not be used.*

## 4.17 Toilet Stalls.

**4.17.1 Location.** Accessible toilet stalls shall be on an accessible route and shall meet the requirements of 4.17.

**4.17.2 Water Closets.** Water closets in accessible stalls shall comply with 4.16.

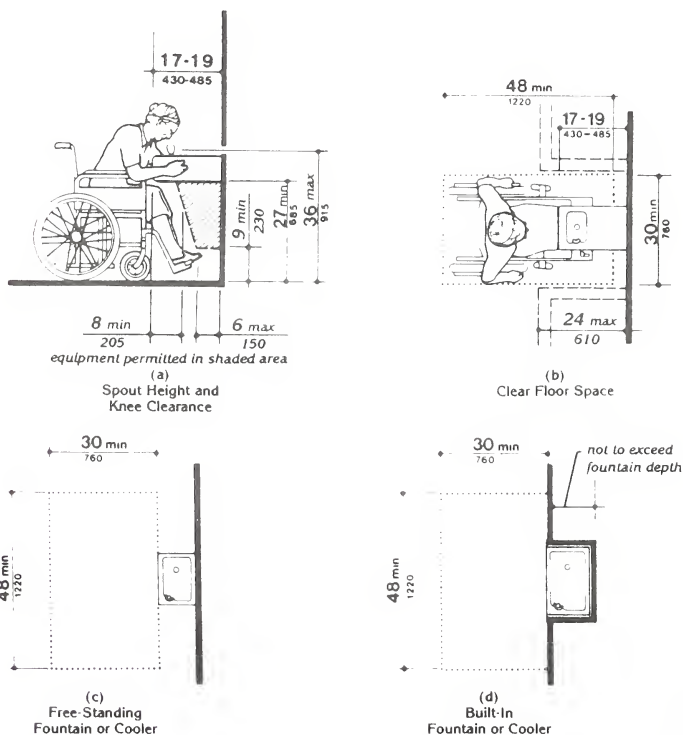


Fig. 27  
Drinking Fountains and Water Coolers

## 4.17 Toilet Stalls

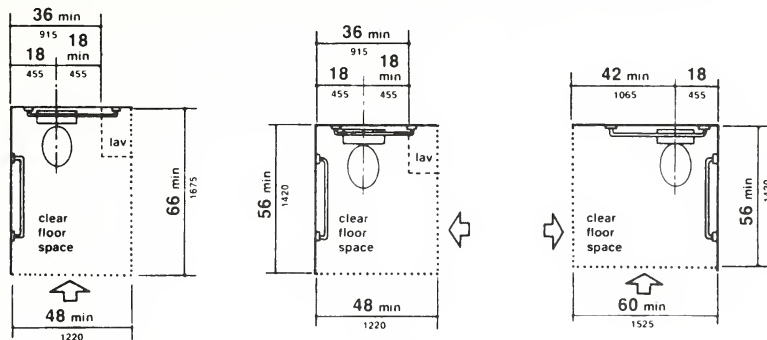


Fig. 28  
Clear Floor Space at Water Closets

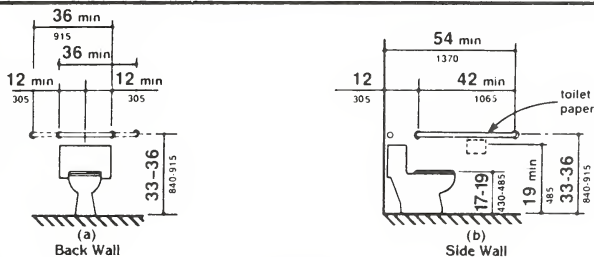


Fig. 29  
Grab Bars at Water Closets

**4.17.3\* Size and Arrangement.** The size and arrangement of the standard toilet stall shall comply with Fig. 30(a), *Standard Stall*. Standard toilet stalls with a minimum depth of 56 in (1420 mm) (see Fig. 30(a)) shall have wall-mounted water closets. If the depth of a standard toilet stall is increased at least 3 in (75 mm), then a floor-mounted water closet may be used. Arrangements shown for standard toilet stalls may be reversed to allow either a left- or right-hand approach. Additional stalls shall be provided in conformance with 4.22.4.

**EXCEPTION:** In instances of alteration work where provision of a standard stall (Fig. 30(a))

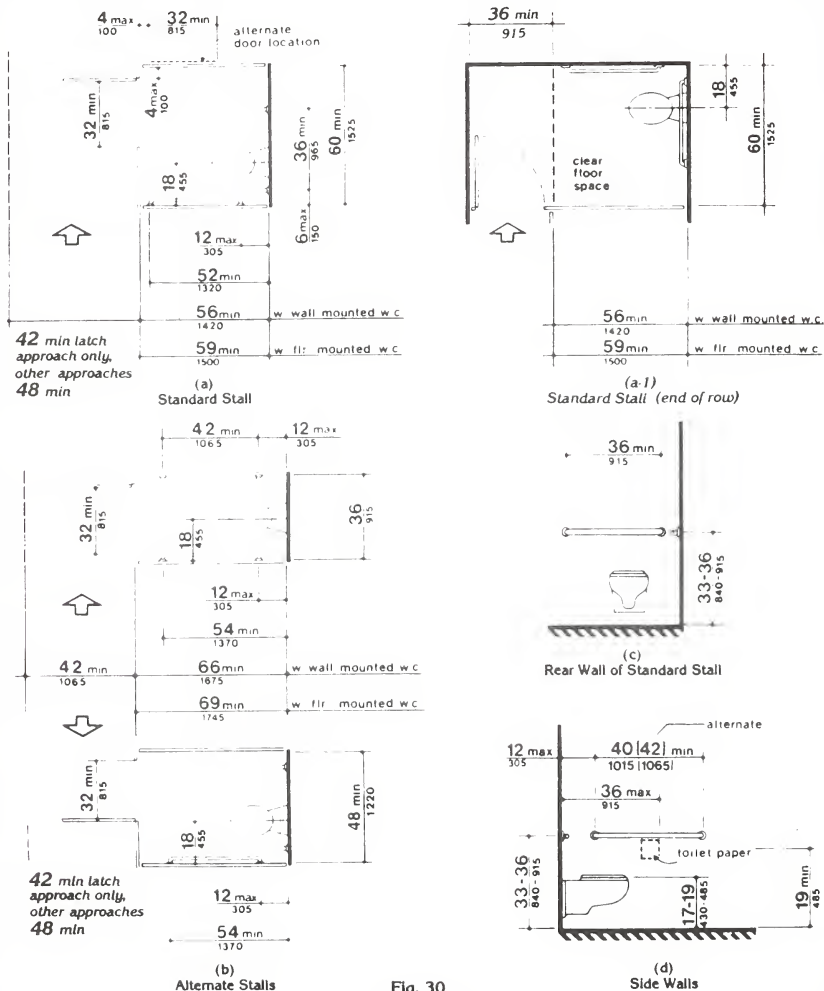
is technically infeasible or where plumbing code requirements prevent combining existing stalls to provide space, either alternate stall (Fig. 30(b)) may be provided in lieu of the standard stall.

**4.17.4 Toe Clearances.** In standard stalls, the front partition and at least one side partition shall provide a toe clearance of at least 9 in (230 mm) above the floor. If the depth of the stall is greater than 60 in (1525 mm), then the toe clearance is not required.

**4.17.5\* Doors.** Toilet stall doors, including door hardware, shall comply with 4.13. If toilet stall approach is from the latch side of the stall door, clearance between the door side of the



## 4.17 Toilet Stalls

Fig. 30  
Toilet Stalls

## 4.19 Lavatories and Mirrors

stall and any obstruction may be reduced to a minimum of 42 in (1065 mm) (Fig. 30).

**4.17.6 Grab Bars.** Grab bars complying with the length and positioning shown in Fig. 30(a), (b), (c), and (d) shall be provided. Grab bars may be mounted with any desired method as long as they have a gripping surface at the locations shown and do not obstruct the required clear floor area. Grab bars shall comply with 4.26.

### 4.18 Urinals.

**4.18.1 General.** Accessible urinals shall comply with 4.18.

**4.18.2 Height.** Urinals shall be stall-type or wall-hung with an elongated rim at a maximum of 17 in (430 mm) above the finish floor.

**4.18.3 Clear Floor Space.** A clear floor space 30 in by 48 in (760 mm by 1220 mm) shall be provided in front of urinals to allow forward approach. This clear space shall adjoin or overlap an accessible route and shall comply with 4.2.4. *Urinal shields that do not extend beyond the front edge of the urinal rim may be provided with 29 in (735 mm) clearance between them.*

**4.18.4 Flush Controls.** Flush controls shall be hand operated or automatic, and shall comply with 4.27.4, and shall be mounted no more than 44 in (1120 mm) above the finish floor.

## 4.19 Lavatories and Mirrors.

**4.19.1 General.** The requirements of 4.19 shall apply to lavatory fixtures, vanities, and built-in lavatories.

**4.19.2 Height and Clearances.** Lavatories shall be mounted with the rim or counter surface no higher than 34 in (865 mm) above the finish floor. Provide a clearance of at least 29 in (735 mm) above the finish floor to the bottom of the apron. Knee and toe clearance shall comply with Fig. 31.

**4.19.3 Clear Floor Space.** A clear floor space 30 in by 48 in (760 mm by 1220 mm) complying with 4.2.4 shall be provided in front of a lavatory to allow forward approach. Such

clear floor space shall adjoin or overlap an accessible route and shall extend a maximum of 19 in (485 mm) underneath the lavatory (see Fig. 32).

**4.19.4 Exposed Pipes and Surfaces.** Hot water and drain pipes under lavatories shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories.

**4.19.5 Faucets.** Faucets shall comply with 4.27.4. Lever-operated, push-type, and electronically controlled mechanisms are examples of acceptable designs. *If self-closing valves are*

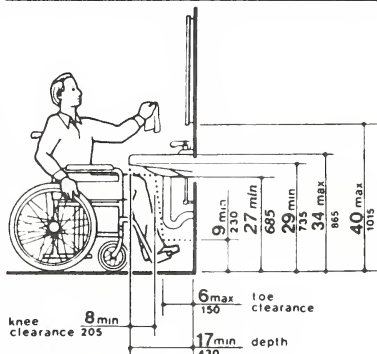


Fig. 31  
Lavatory Clearances

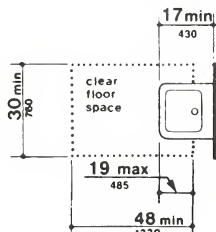


Fig. 32  
Clear Floor Space at Lavatories

**4.20 Bathtubs**

used the faucet *shall remain* open for at least 10 seconds.

**4.19.6\* Mirrors.** Mirrors shall be mounted with the bottom edge of the reflecting surface no higher than 40 in (1015 mm) above the finish floor (see Fig. 31).

**4.20 Bathtubs.**

**4.20.1 General.** Accessible bathtubs shall comply with 4.20.

**4.20.2 Floor Space.** Clear floor space in front of bathtubs shall be as shown in Fig. 33.

**4.20.3 Seat.** An in-tub seat or a seat at the head end of the tub shall be provided as shown in Fig. 33 and 34. The structural strength of seats and their attachments shall comply with 4.26.3. Seats shall be mounted securely and shall not slip during use.

**4.20.4 Grab Bars.** Grab bars complying with 4.26 shall be provided as shown in Fig. 33 and 34.

**4.20.5 Controls.** Faucets and other controls complying with 4.27.4 shall be located as shown in Fig. 34.

**4.20.6 Shower Unit.** A shower spray unit with a hose at least 60 in (1525 mm) long that can be used *both* as a fixed shower head and as a hand-held shower shall be provided.

**4.20.7 Bathtub Enclosures.** If provided, enclosures for bathtubs shall not obstruct controls or transfer from wheelchairs onto bathtub seats or into tubs. Enclosures on bathtubs shall not have tracks mounted on their rims.

**4.21 Shower Stalls.**

**4.21.1\* General.** Accessible shower stalls shall comply with 4.21.

**4.21.2 Size and Clearances.** Except as specified in 9.1.2, shower stall size and clear floor space shall comply with Fig. 35(a) or (b). The shower stall in Fig. 35(a) shall be 36 in by 36 in (915 mm by 915 mm). Shower stalls required by 9.1.2 shall comply with Fig. 57(a)

or (b). The shower stall in Fig. 35(b) will fit into the space required for a bathtub.

**4.21.3 Seat.** A seat shall be provided in shower stalls 36 in by 36 in (915 mm by 915 mm) and shall be as shown in Fig. 36. The seat shall be mounted 17 in to 19 in (430 mm to 485 mm) from the bathroom floor and shall extend the full depth of the stall. In a 36 in by 36 in (915 mm by 915 mm) shower stall, the seat shall be on the wall opposite the controls. *Where a fixed seat is provided in a 30 in by 60 in minimum (760 mm by 1525 mm) shower stall, it shall be a folding type and shall be mounted on the wall adjacent to the controls as shown in Fig. 57.* The structural strength of seats and their attachments shall comply with 4.26.3.

**4.21.4 Grab Bars.** Grab bars complying with 4.26 shall be provided as shown in Fig. 37.

**4.21.5 Controls.** Faucets and other controls complying with 4.27.4 shall be located as shown in Fig. 37. In shower stalls 36 in by 36 in (915 mm by 915 mm), all controls, faucets, and the shower unit shall be mounted on the side wall opposite the seat.

**4.21.6 Shower Unit.** A shower spray unit with a hose at least 60 in (1525 mm) long that can be used *both* as a fixed shower head and as a hand-held shower shall be provided.

*EXCEPTION: In unmonitored facilities where vandalism is a consideration, a fixed shower head mounted at 48 in (1220 mm) above the shower floor may be used in lieu of a hand-held shower head.*

**4.21.7 Curbs.** If provided, curbs in shower stalls 36 in by 36 in (915 mm by 915 mm) shall be no higher than 1/2 in (13 mm). Shower stalls that are 30 in by 60 in (760 mm by 1525 mm) minimum shall not have curbs.

**4.21.8 Shower Enclosures.** If provided, enclosures for shower stalls shall not obstruct controls or obstruct transfer from wheelchairs onto shower seats.

**4.22 Toilet Rooms.**

**4.22.1 Minimum Number.** Toilet facilities required to be accessible by 4.1 shall comply

## 4.21 Shower Stalls

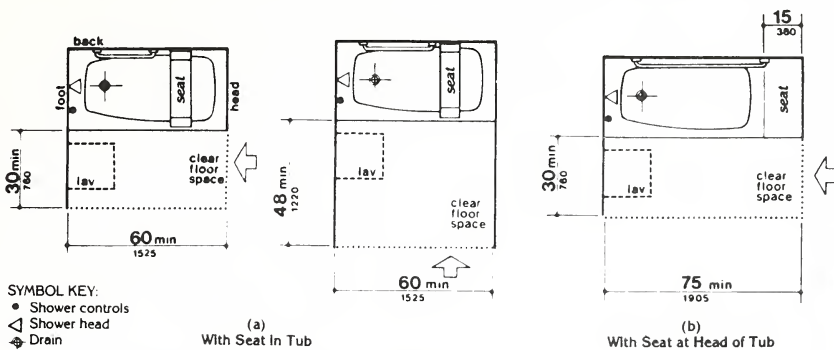


Fig. 33  
Clear Floor Space at Bathtubs

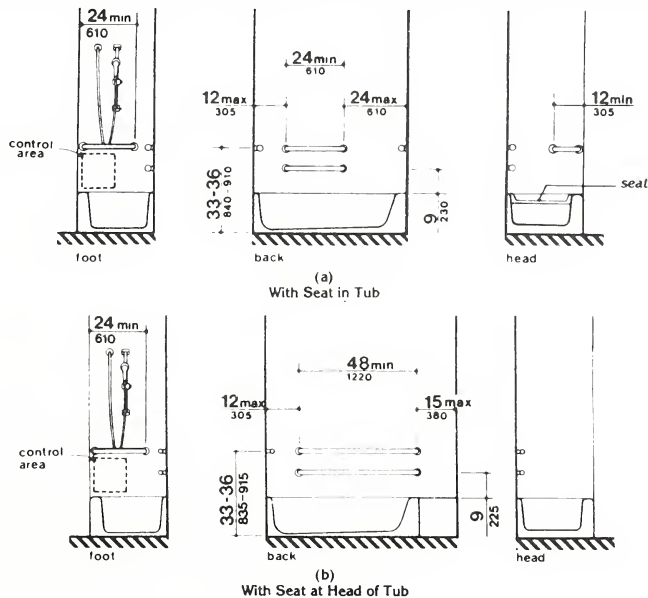


Fig. 34  
Grab Bars at Bathtubs

## 4.22 Toilet Rooms

with 4.22. Accessible toilet rooms shall be on an accessible route.

**4.22.2 Doors.** All doors to accessible toilet rooms shall comply with 4.13. Doors shall not swing into the clear floor space required for any fixture.

**4.22.3\* Clear Floor Space.** The accessible fixtures and controls required in 4.22.4, 4.22.5, 4.22.6, and 4.22.7 shall be on an accessible route. An unobstructed turning space complying with 4.2.3 shall be provided within an accessible toilet room. The clear floor space at fixtures and controls, the accessible route, and the turning space may overlap.

**4.22.4 Water Closets.** If toilet stalls are provided, then at least one shall be a standard

toilet stall complying with 4.17; where 6 or more stalls are provided, in addition to the stall complying with 4.17.3, at least one stall 36 in (915 mm) wide with an outward swinging, self-closing door and parallel grab bars complying with Fig. 30(d) and 4.26 shall be provided. Water closets in such stalls shall comply with 4.16. If water closets are not in stalls, then at least one shall comply with 4.16.

**4.22.5 Urinals.** If urinals are provided, then at least one shall comply with 4.18.

**4.22.6 Lavatories and Mirrors.** If lavatories and mirrors are provided, then at least one of each shall comply with 4.19.

**4.22.7 Controls and Dispensers.** If controls, dispensers, receptacles, or other

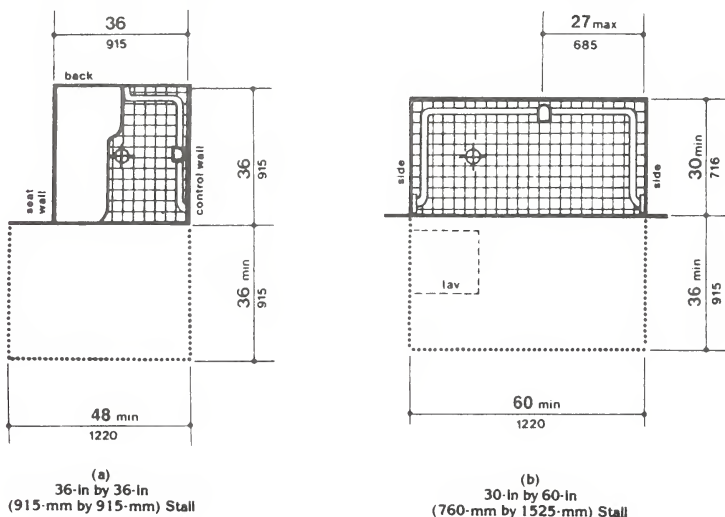


Fig. 35  
Shower Size and Clearances

## 4.23 Bathrooms, Bathing Facilities, and Shower Rooms

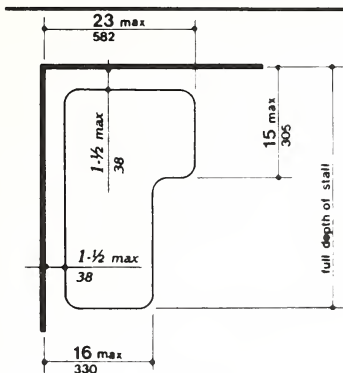


Fig. 36

Shower Seat Design

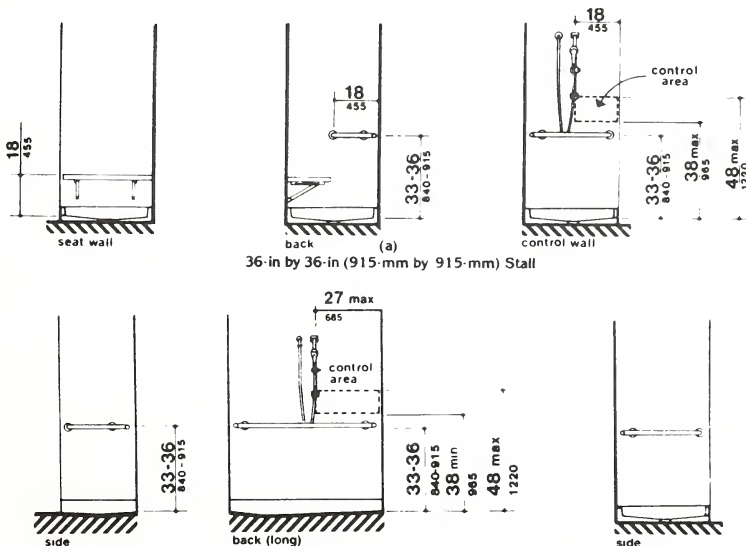
equipment are provided, then at least one of each shall be on an accessible route and shall comply with 4.27.

### 4.23 Bathrooms, Bathing Facilities, and Shower Rooms.

**4.23.1 Minimum Number.** Bathrooms, bathing facilities, or shower rooms required to be accessible by 4.1 shall comply with 4.23 and shall be on an accessible route.

**4.23.2 Doors.** Doors to accessible bathrooms shall comply with 4.13. Doors shall not swing into the floor space required for any fixture.

**4.23.3\* Clear Floor Space.** The accessible fixtures and controls required in 4.23.4, 4.23.5, 4.23.6, 4.23.7, 4.23.8, and 4.23.9 shall be on an accessible route. An unobstructed turning



NOTE: Shower head and control area may be on back (long) wall (as shown) or on either side wall.

(b)

30-in by 60-in (760-mm by 1525-mm) Stall

Fig. 37

Grab Bars at Shower Stalls



## 4.24 Sinks

space complying with 4.2.3 shall be provided within an accessible bathroom. The clear floor spaces at fixtures and controls, the accessible route, and the turning space may overlap.

**4.23.4 Water Closets.** If toilet stalls are provided, then at least one shall be a standard toilet stall complying with 4.17; *where 6 or more stalls are provided, in addition to the stall complying with 4.17.3, at least one stall 36 in (915 mm) wide with an outward swinging, self-closing door and parallel grab bars complying with Fig. 30(d) and 4.26 shall be provided.* Water closets in such stalls shall comply with 4.16. If water closets are not in stalls, then at least one shall comply with 4.16.

**4.23.5 Urinals.** If urinals are provided, then at least one shall comply with 4.18.

**4.23.6 Lavatories and Mirrors.** If lavatories and mirrors are provided, then at least one of each shall comply with 4.19.

**4.23.7 Controls and Dispensers.** If controls, dispensers, receptacles, or other equipment are provided, then at least one of each shall be on an accessible route and shall comply with 4.27.

**4.23.8 Bathing and Shower Facilities.** If tubs or showers are provided, then at least one accessible tub that complies with 4.20 or at least one accessible shower that complies with 4.21 shall be provided.

**4.23.9\* Medicine Cabinets.** If medicine cabinets are provided, at least one shall be located with a usable shelf no higher than 44 in (1120 mm) above the floor space. The floor space shall comply with 4.2.4.

#### 4.24 Sinks.

**4.24.1 General.** Sinks required to be accessible by 4.1 shall comply with 4.24.

**4.24.2 Height.** Sinks shall be mounted with the counter or rim no higher than 34 in (865 mm) above the finish floor.

**4.24.3 Knee Clearance.** Knee clearance that is at least 27 in (685 mm) high, 30 in (760 mm) wide, and 19 in (485 mm) deep shall be pro-

vided underneath sinks.

**4.24.4 Depth.** Each sink shall be a maximum of 6-1/2 in (165 mm) deep.

**4.24.5 Clear Floor Space.** A clear floor space at least 30 in by 48 in (760 mm by 1220 mm) complying with 4.2.4 shall be provided in front of a sink to allow forward approach. The clear floor space shall be on an accessible route and shall extend a maximum of 19 in (485 mm) underneath the sink (see Fig. 32).

**4.24.6 Exposed Pipes and Surfaces.** Hot water and drain pipes exposed under sinks shall be insulated or otherwise configured so as to protect against contact. There shall be no sharp or abrasive surfaces under sinks.

**4.24.7 Faucets.** Faucets shall comply with 4.27.4. Lever-operated, push-type, touch-type, or electronically controlled mechanisms are acceptable designs.

#### 4.25 Storage.

**4.25.1 General.** Fixed storage facilities such as cabinets, shelves, closets, and drawers required to be accessible by 4.1 shall comply with 4.25.

**4.25.2 Clear Floor Space.** A clear floor space at least 30 in by 48 in (760 mm by 1220 mm) complying with 4.2.4 that allows either a forward or parallel approach by a person using a wheelchair shall be provided at accessible storage facilities.

**4.25.3 Height.** Accessible storage spaces shall be within at least one of the reach ranges specified in 4.2.5 and 4.2.6 (see Fig. 5 and Fig. 6). Clothes rods or shelves shall be a maximum of 54 in (1370 mm) above the finish floor for a side approach. Where the distance from the wheelchair to the clothes rod or shelf exceeds 10 in (255 mm) (as in closets without accessible doors) the height and depth to the rod or shelf shall comply with Fig. 38(a) and Fig. 38(b).

**4.25.4 Hardware.** Hardware for accessible storage facilities shall comply with 4.27.4. Touch latches and U-shaped pulls are acceptable.

## 4.26 Handrails, Grab Bars, and Tub and Shower Seats

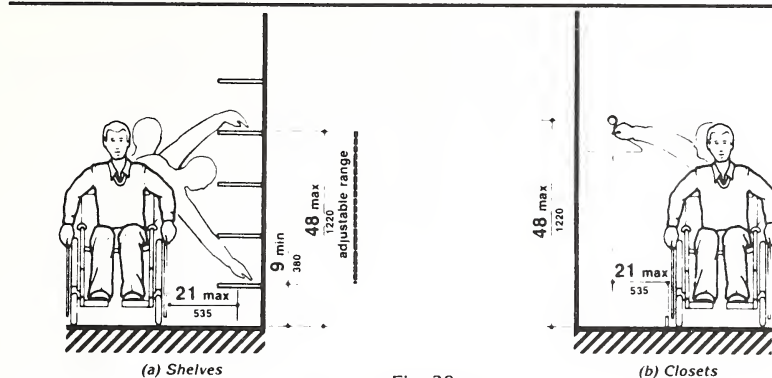


Fig. 38  
Storage Shelves and Closets

### 4.26 Handrails, Grab Bars, and Tub and Shower Seats.

**4.26.1\* General.** All handrails, grab bars, and tub and shower seats required to be accessible by 4.1, 4.8, 4.9, 4.16, 4.17, 4.20 or 4.21 shall comply with 4.26.

**4.26.2\* Size and Spacing of Grab Bars and Handrails.** The diameter or width of the gripping surfaces of a handrail or grab bar shall be 1-1/4 in to 1-1/2 in (32 mm to 38 mm), or the shape shall provide an equivalent gripping surface. If handrails or grab bars are mounted adjacent to a wall, the space between the wall and the grab bar shall be 1-1/2 in (38 mm) (see Fig. 39(a), (b), (c), and (e)). Handrails may be located in a recess if the recess is a maximum of 3 in (75 mm) deep and extends at least 18 in (455 mm) above the top of the rail (see Fig. 39(d)).

**4.26.3 Structural Strength.** The structural strength of grab bars, tub and shower seats, fasteners, and mounting devices shall meet the following specification:

(1) Bending stress in a grab bar or seat induced by the maximum bending moment from the application of 250 lbf (1112N) shall

be less than the allowable stress for the material of the grab bar or seat.

(2) Shear stress induced in a grab bar or seat by the application of 250 lbf (1112N) shall be less than the allowable shear stress for the material of the grab bar or seat. If the connection between the grab bar or seat and its mounting bracket or other support is considered to be fully restrained, then direct and torsional shear stresses shall be totaled for the combined shear stress, which shall not exceed the allowable shear stress.

(3) Shear force induced in a fastener or mounting device from the application of 250 lbf (1112N) shall be less than the allowable lateral load of either the fastener or mounting device or the supporting structure, whichever is the smaller allowable load.

(4) Tensile force induced in a fastener by a direct tension force of 250 lbf (1112N) plus the maximum moment from the application of 250 lbf (1112N) shall be less than the allowable withdrawal load between the fastener and the supporting structure.

(5) Grab bars shall not rotate within their fittings.



## 4.26 Handrails, Grab Bars, and Tub and Shower Seats

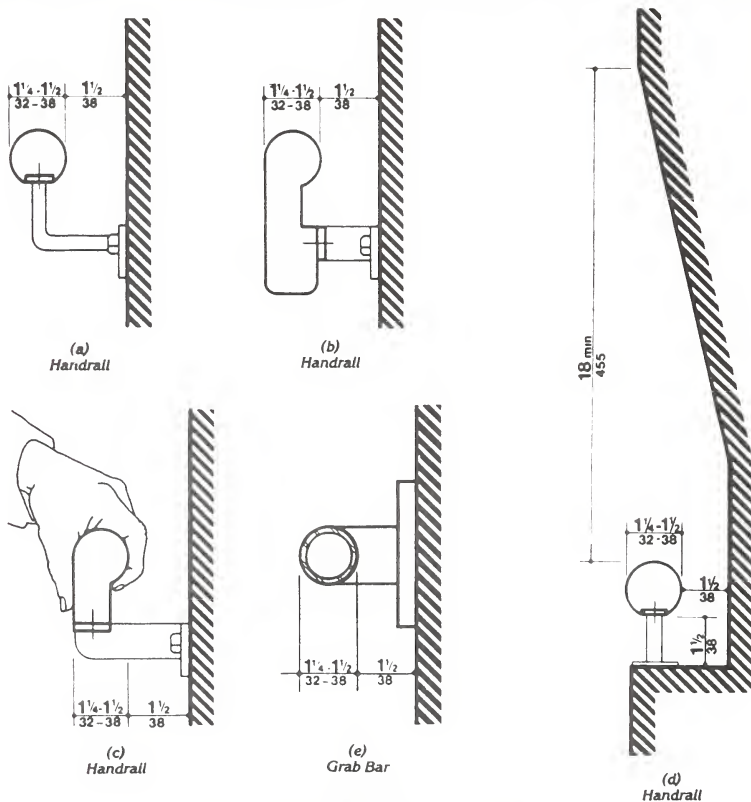


Fig. 39  
Size and Spacing of Handrails and Grab Bars

**4.26.4 Eliminating Hazards.** A handrail or grab bar and any wall or other surface adjacent to it shall be free of any sharp or abrasive elements. Edges shall have a minimum radius of 1/8 in (3.2 mm).

#### 4.27 Controls and Operating Mechanisms.

**4.27.1 General.** Controls and operating mechanisms required to be accessible by 4.1 shall comply with 4.27.

## 4.28 Alarms

**4.27.2 Clear Floor Space.** Clear floor space complying with 4.2.4 that allows a forward or a parallel approach by a person using a wheel-chair shall be provided at controls, dispensers, receptacles, and other operable equipment.

**4.27.3\* Height.** The highest operable part of controls, dispensers, receptacles, and other operable equipment shall be placed within at least one of the reach ranges specified in 4.2.5 and 4.2.6. Electrical and communications system receptacles on walls shall be mounted no less than 15 in (380 mm) above the floor.

*EXCEPTION:* These requirements do not apply where the use of special equipment dictates otherwise or where electrical and communications systems receptacles are not normally intended for use by building occupants.

**4.27.4 Operation.** Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N).

## 4.28 Alarms.

**4.28.1 General.** Alarm systems required to be accessible by 4.1 shall comply with 4.28. At a minimum, visual signal appliances shall be provided in buildings and facilities in each of the following areas: restrooms and any other general usage areas (e.g., meeting rooms), hallways, lobbies, and any other area for common use.

**4.28.2\* Audible Alarms.** If provided, audible emergency alarms shall produce a sound that exceeds the prevailing equivalent sound level in the room or space by at least 15 dBA or exceeds any maximum sound level with a duration of 60 seconds by 5 dBA, whichever is louder. Sound levels for alarm signals shall not exceed 120 dBA.

**4.28.3\* Visual Alarms.** Visual alarm signal appliances shall be integrated into the building or facility alarm system. If single station audible alarms are provided then single station visual alarm signals shall be provided. Visual alarm signals shall have the following minimum photometric and location features:

(1) The lamp shall be a xenon strobe type or equivalent.

(2) The color shall be clear or nominal white (i.e., unfiltered or clear filtered white light).

(3) The maximum pulse duration shall be two-tenths of one second (0.2 sec) with a maximum duty cycle of 40 percent. The pulse duration is defined as the time interval between initial and final points of 10 percent of maximum signal.

(4) The intensity shall be a minimum of 75 candela.

(5) The flash rate shall be a minimum of 1 Hz and a maximum of 3 Hz.

(6) The appliance shall be placed 80 in (2030 mm) above the highest floor level within the space or 6 in (152 mm) below the ceiling, whichever is lower.

(7) In general, no place in any room or space required to have a visual signal appliance shall be more than 50 ft (15 m) from the signal (in the horizontal plane). In large rooms and spaces exceeding 100 ft (30 m) across, without obstructions 6 ft (2 m) above the finish floor, such as auditoriums, devices may be placed around the perimeter, spaced a maximum 100 ft (30 m) apart, in lieu of suspending appliances from the ceiling.

(8) No place in common corridors or hallways in which visual alarm signalling appliances are required shall be more than 50 ft (15 m) from the signal.

**4.28.4\* Auxiliary Alarms.** Units and sleeping accommodations shall have a visual alarm connected to the building emergency alarm system or shall have a standard 110-volt electrical receptacle into which such an alarm can be connected and a means by which a signal from the building emergency alarm system can trigger such an auxiliary alarm. When visual alarms are in place the signal shall be visible in all areas of the unit or room. Instructions for use of the auxiliary alarm or receptacle shall be provided.

## 4.29 Detectable Warnings

**4.29 Detectable Warnings.**

**4.29.1 General.** Detectable warnings required by 4.1 and 4.7 shall comply with 4.29.

**4.29.2\* Detectable Warnings on Walking Surfaces.** Detectable warnings shall consist of raised truncated domes with a diameter of nominal 0.9 in (23 mm), a height of nominal 0.2 in (5 mm) and a center-to-center spacing of nominal 2.35 in (60 mm) and shall contrast visually with adjoining surfaces, either light on dark, or dark on light.

The material used to provide contrast shall be an integral part of the walking surface. Detectable warnings used on interior surfaces shall differ from adjoining walking surfaces in resiliency or sound-on-care contact.

**4.29.3 Detectable Warnings on Doors To Hazardous Areas.** (Reserved).

**4.29.4 Detectable Warnings at Stairs.** (Reserved).

**4.29.5 Detectable Warnings at Hazardous Vehicular Areas.** If a walk crosses or adjoins a vehicular way, and the walking surfaces are not separated by curbs, railings, or other elements between the pedestrian areas and vehicular areas, the boundary between the areas shall be defined by a continuous detectable warning which is 36 in (915 mm) wide, complying with 4.29.2.

**4.29.6 Detectable Warnings at Reflecting Pools.** The edges of reflecting pools shall be protected by railings, walls, curbs, or detectable warnings complying with 4.29.2.

**4.29.7 Standardization.** (Reserved).

**4.30 Signage.**

**4.30.1\* General.** Signage required to be accessible by 4.1 shall comply with the applicable provisions of 4.30.

**4.30.2\* Character Proportion.** Letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke-width-to-height ratio between 1:5 and 1:10.

**4.30.3 Character Height.** Characters and numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case X. Lower case characters are permitted.

Height Above Finished Floor	Minimum Character Height
Suspended or Projected Overhead in compliance with 4.4.2	3 in. (75 mm) minimum

**4.30.4\* Raised and Brailled Characters and Pictorial Symbol Signs (Pictograms).** Letters and numerals shall be raised 1/32 in, upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille. Raised characters shall be at least 5/8 in (16 mm) high, but no higher than 2 in (50 mm). Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. The border dimension of the pictogram shall be 6 in (152 mm) minimum in height.

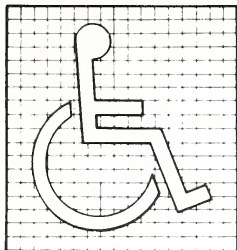
**4.30.5\* Finish and Contrast.** The characters and background of signs shall be eggshell, matte, or other non-glare finish. Characters and symbols shall contrast with their background — either light characters on a dark background or dark characters on a light background.

**4.30.6 Mounting Location and Height.** Where permanent identification is provided for rooms and spaces, signs shall be installed on the wall adjacent to the latch side of the door. Where there is no wall space to the latch side of the door, including at double leaf doors, signs shall be placed on the nearest adjacent wall. Mounting height shall be 60 in (1525 mm) above the finish floor to the centerline of the sign. Mounting location for such signage shall be so that a person may approach within 3 in (76 mm) of signage without encountering protruding objects or standing within the swing of a door.

**4.30.7\* Symbols of Accessibility.**

(1) Facilities and elements required to be identified as accessible by 4.1 shall use the international symbol of accessibility. The

## 4.30 Signage



(a)

Proportions

International Symbol of Accessibility



(b)

Display Conditions

International Symbol of Accessibility



(c)

International TDD Symbol



(d)

International Symbol of Access for Hearing Loss

Fig. 43

International Symbols

symbol shall be displayed as shown in Fig. 43(a) and (b).

(2) *Volume Control Telephones.* Telephones required to have a volume control by 4.1.3(17)(b) shall be identified by a sign containing a depiction of a telephone handset with radiating sound waves.

(3) *Text Telephones.* Text telephones required by 4.1.3 (17)(c) shall be identified by the international TDD symbol (Fig 43(c)). In addition, if a facility has a public text telephone, directional signage indicating the location of the nearest text telephone shall be placed adjacent to all banks of telephones which do not contain a text telephone. Such directional signage shall include the international TDD symbol. If a facility has no banks of telephones, the directional signage shall be provided at the entrance (e.g., in a building directory).

(4) *Assistive Listening Systems.* In assembly areas where permanently installed assistive listening systems are required by 4.1.3(19)(b) the availability of such systems shall be identified with signage that includes the international symbol of access for hearing loss (Fig 43(d)).

### 4.30.8\* Illumination Levels. (Reserved).

## 4.31 Telephones.

**4.31.1 General.** Public telephones required to be accessible by 4.1 shall comply with 4.31.

**4.31.2 Clear Floor or Ground Space.** A clear floor or ground space at least 30 in by 48 in (760 mm by 1220 mm) that allows either a forward or parallel approach by a person using a wheelchair shall be provided at telephones (see Fig. 44). The clear floor or ground space shall comply with 4.2.4. Bases, enclosures, and fixed seats shall not impede approaches to telephones by people who use wheelchairs.

**4.31.3\* Mounting Height.** The highest operable part of the telephone shall be within the reach ranges specified in 4.2.5 or 4.2.6.

**4.31.4 Protruding Objects.** Telephones shall comply with 4.4.

## 4.31 Telephones

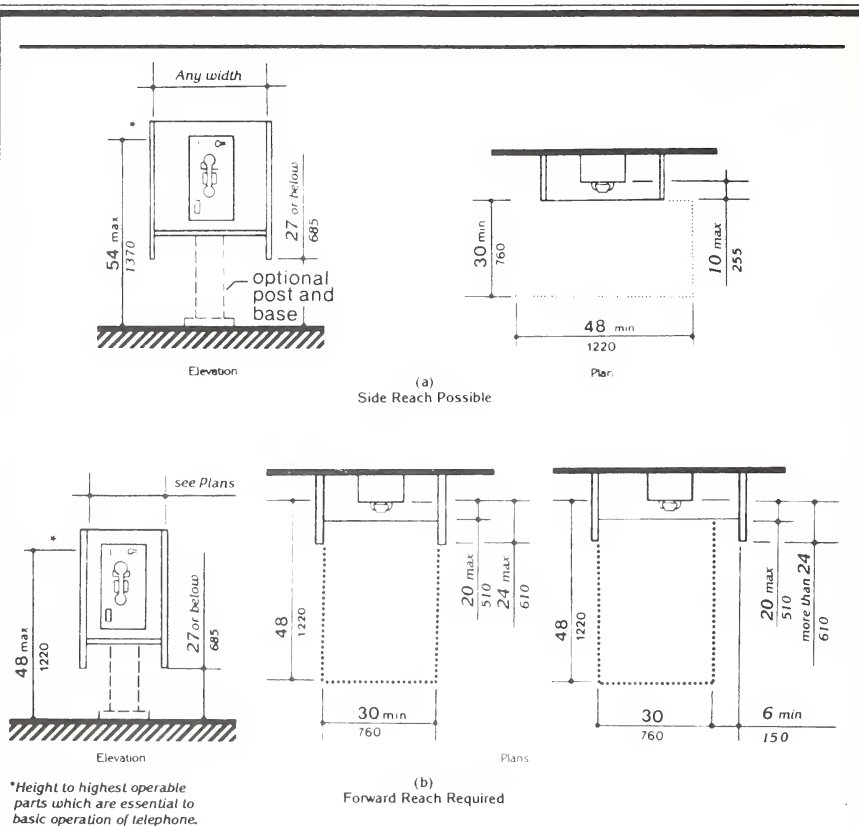


Fig. 44  
Mounting Heights and Clearances for Telephones

#### 4.31.5 Hearing Aid Compatible and Volume Control Telephones Required by 4.1.

(1) Telephones shall be hearing aid compatible.

(2) Volume controls, capable of a minimum of 12 dbA and a maximum of 18 dbA above

normal, shall be provided in accordance with 4.1.3. If an automatic reset is provided then 18 dbA may be exceeded.

**4.31.6 Controls.** Telephones shall have pushbutton controls where service for such equipment is available.



## 4.32 Fixed or Built-in Seating and Tables

**4.31.7 Telephone Books.** Telephone books, if provided, shall be located in a position that complies with the reach ranges specified in 4.2.5 and 4.2.6.

**4.31.8 Cord Length.** The cord from the telephone to the handset shall be at least 29 in (735 mm) long.

### 4.31.9\* Text Telephones Required by 4.1.

(1) Text telephones used with a pay telephone shall be permanently affixed within, or adjacent to, the telephone enclosure. If an acoustic coupler is used, the telephone cord shall be sufficiently long to allow connection of the text telephone and the telephone receiver.

(2) Pay telephones designed to accommodate a portable text telephone shall be equipped with a shelf and an electrical outlet within or adjacent to the telephone enclosure. The telephone handset shall be capable of being placed flush on the surface of the shelf. The shelf shall be capable of accommodating a text telephone and shall have 6 in (152 mm) minimum vertical clearance in the area where the text telephone is to be placed.

(3) Equivalent facilitation may be provided. For example, a portable text telephone may be made available in a hotel at the registration desk if it is available on a 24-hour basis for use with nearby public pay telephones. In this instance, at least one pay telephone shall comply with paragraph 2 of this section. In addition, if an acoustic coupler is used, the telephone handset cord shall be sufficiently long so as to allow connection of the text telephone and the telephone receiver. Directional signage shall be provided and shall comply with 4.30.7.

## 4.32 Fixed or Built-in Seating and Tables.

**4.32.1 Minimum Number.** Fixed or built-in seating or tables required to be accessible by 4.1 shall comply with 4.32.

**4.32.2 Seating.** If seating spaces for people in wheelchairs are provided at fixed tables or counters, clear floor space complying with 4.2.4 shall be provided. Such clear floor space

shall not overlap knee space by more than 19 in (485 mm) (see Fig. 45).

**4.32.3 Knee Clearances.** If seating for people in wheelchairs is provided at tables or counters, knee spaces at least 27 in (685 mm) high, 30 in (760 mm) wide, and 19 in (485 mm) deep shall be provided (see Fig. 45).

**4.32.4\* Height of Tables or Counters.** The tops of accessible tables and counters shall be from 28 in to 34 in (710 mm to 865 mm) above the finish floor or ground.

## 4.33 Assembly Areas.

**4.33.1 Minimum Number.** Assembly and associated areas required to be accessible by 4.1 shall comply with 4.33.

**4.33.2\* Size of Wheelchair Locations.** Each wheelchair location shall provide minimum clear ground or floor spaces as shown in Fig. 46.

**4.33.3\* Placement of Wheelchair Locations.** Wheelchair areas shall be an integral part of any fixed seating plan and shall be provided so as to provide people with physical disabilities a choice of admission prices and lines of sight comparable to those for members of the general public. They shall adjoin an accessible route that also serves as a means of egress in case of emergency. At least one companion fixed seat shall be provided next to each wheelchair seating area. When the seating capacity exceeds 300, wheelchair spaces shall be provided in more than one location. Readily removable seats may be installed in wheelchair spaces when the spaces are not required to accommodate wheelchair users.

**EXCEPTION:** Accessible viewing positions may be clustered for bleachers, balconies, and other areas having sight lines that require slopes of greater than 5 percent. Equivalent accessible viewing positions may be located on levels having accessible egress.

**4.33.4 Surfaces.** The ground or floor at wheelchair locations shall be level and shall comply with 4.5.

## 4.33 Assembly Areas

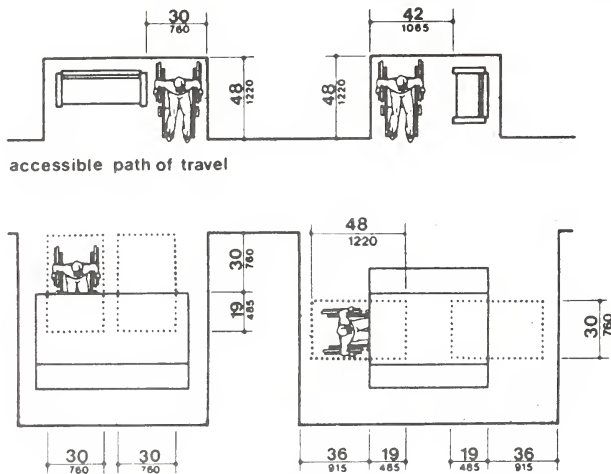


Fig. 45  
Minimum Clearances for Seating and Tables

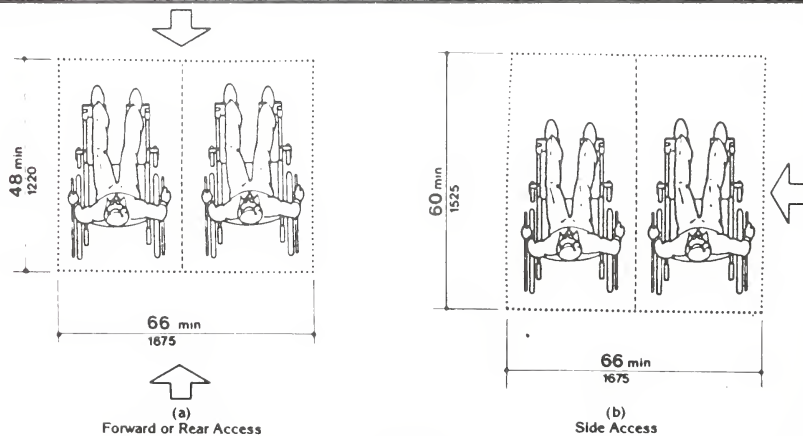


Fig. 46  
Space Requirements for Wheelchair  
Seating Spaces in Series

## 4.34 Automated Teller Machines

### 4.33.5 Access to Performing Areas.

An accessible route shall connect wheelchair seating locations with performing areas, including stages, arena floors, dressing rooms, locker rooms, and other spaces used by performers.

### 4.33.6\* Placement of Listening Systems.

If the listening system provided serves individual fixed seats, then such seats shall be located within a 50 ft (15 m) viewing distance of the stage or playing area and shall have a complete view of the stage or playing area.

### 4.33.7\* Types of Listening Systems.

Assistive listening systems (ALS) are intended to augment standard public address and audio systems by providing signals which can be received directly by persons with special receivers or their own hearing aids and which eliminate or filter background noise. The type of assistive listening system appropriate for a particular application depends on the characteristics of the setting, the nature of the program, and the intended audience. Magnetic induction loops, infra-red and radio frequency systems are types of listening systems which are appropriate for various applications.

## 4.34 Automated Teller Machines.

**4.34.1 General.** Each machine required to be accessible by 4.1.3 shall be on an accessible route and shall comply with 4.34.

**4.34.2 Controls.** Controls for user activation shall comply with the requirements of 4.27.

### 4.34.3 Clearances and Reach Range.

Free standing or built-in units not having a clear space under them shall comply with 4.27.2 and 4.27.3 and provide for a parallel approach and both a forward and side reach to the unit allowing a person in a wheelchair to access the controls and dispensers.

**4.34.4 Equipment for Persons with Vision Impairments.** Instructions and all information for use shall be made accessible to and independently usable by persons with vision impairments.

## 4.35 Dressing and Fitting Rooms.

**4.35.1 General.** Dressing and fitting rooms required to be accessible by 4.1 shall comply with 4.35 and shall be on an accessible route.

**4.35.2 Clear Floor Space.** A clear floor space allowing a person using a wheelchair to make a 180-degree turn shall be provided in every accessible dressing room entered through a swinging or sliding door. No door shall swing into any part of the turning space. Turning space shall not be required in a private dressing room entered through a curtained opening at least 32 in (815 mm) wide if clear floor space complying with section 4.2 renders the dressing room usable by a person using a wheelchair.

**4.35.3 Doors.** All doors to accessible dressing rooms shall be in compliance with section 4.13.

**4.35.4 Bench.** Every accessible dressing room shall have a 24 in by 48 in (610 mm by 1220 mm) bench fixed to the wall along the longer dimension. The bench shall be mounted 17 in to 19 in (430 mm to 485 mm) above the finish floor. Clear floor space shall be provided alongside the bench to allow a person using a wheelchair to make a parallel transfer onto the bench. The structural strength of the bench and attachments shall comply with 4.26.3. Where installed in conjunction with showers, swimming pools, or other wet locations, water shall not accumulate upon the surface of the bench and the bench shall have a slip-resistant surface.

**4.35.5 Mirror.** Where mirrors are provided in dressing rooms of the same use, then in an accessible dressing room, a full-length mirror, measuring at least 18 in wide by 54 in high (460 mm by 1370 mm), shall be mounted in a position affording a view to a person on the bench as well as to a person in a standing position.

NOTE: Sections 4.1.1 through 4.1.7 and sections 5 through 10 are different from ANSI A117.1 in their entirety and are printed in standard type.



## 5.0 Restaurants and Cafeterias

## 5. RESTAURANTS AND CAFETERIAS.

**5.1\* General.** Except as specified or modified in this section, restaurants and cafeterias shall comply with the requirements of 4.1 to 4.35. Where fixed tables (or dining counters where food is consumed but there is no service) are provided, at least 5 percent, but not less than one, of the fixed tables (or a portion of the dining counter) shall be accessible and shall comply with 4.32 as required in 4.1.3(18). In establishments where separate areas are designated for smoking and non-smoking patrons, the required number of accessible fixed tables (or counters) shall be proportionally distributed between the smoking and non-smoking areas. In new construction, and where practicable in alterations, accessible fixed tables (or counters) shall be distributed throughout the space or facility.

**5.2 Counters and Bars.** Where food or drink is served at counters exceeding 34 in (865 mm) in height for consumption by customers seated on stools or standing at the counter, a portion of the main counter which is 60 in (1525 mm) in length minimum shall be provided in compliance with 4.32 or service shall be available at accessible tables within the same area.

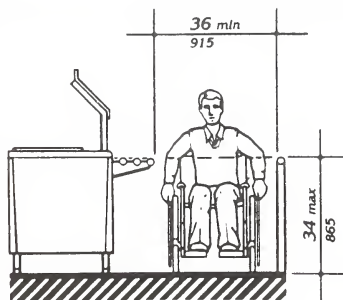


Fig. 53  
Food Service Lines

**5.3 Access Aisles.** All accessible fixed tables shall be accessible by means of an access aisle at least 36 in (915 mm) clear between parallel edges of tables or between a wall and the table edges.

**5.4 Dining Areas.** In new construction, all dining areas, including raised or sunken dining areas, loggias, and outdoor seating areas, shall be accessible. In non-elevator buildings, an accessible means of vertical access to the mezzanine is not required under the following conditions: 1) the area of mezzanine seating measures no more than 33 percent of the area of the total accessible seating area; 2) the same services and decor are provided in an accessible space usable by the general public; and, 3) the accessible areas are not restricted to use by people with disabilities. In alterations, accessibility to raised or sunken dining areas, or to all parts of outdoor seating areas is not required provided that the same services and decor are provided in an accessible space usable by the general public and are not restricted to use by people with disabilities.

**5.5 Food Service Lines.** Food service lines shall have a minimum clear width of 36 in (915 mm), with a preferred clear width of 42 in (1065 mm) to allow passage around a person using a wheelchair. Tray slides shall be mounted no higher than 34 in (865 mm) above the floor (see Fig. 53). If self-service shelves

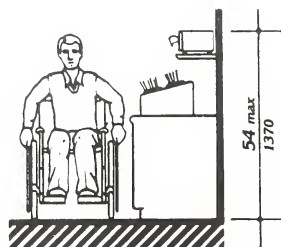


Fig. 54  
Tableware Areas

## 6.0 Medical Care Facilities

are provided, at least 50 percent of each type must be within reach ranges specified in 4.2.5 and 4.2.6.

### 5.6 Tableware and Condiment Areas.

Self-service shelves and dispensing devices for tableware, dishware, condiments, food and beverages shall be installed to comply with 4.2 (see Fig. 54).

**5.7 Raised Platforms.** In banquet rooms or spaces where a head table or speaker's lectern is located on a raised platform, the platform shall be accessible in compliance with 4.8 or 4.11. Open edges of a raised platform shall be protected by placement of tables or by a curb.

### 5.8 Vending Machines and Other Equipment.

Spaces for vending machines and other equipment shall comply with 4.2 and shall be located on an accessible route.

### 5.9 Quiet Areas. (Reserved).

## 6. MEDICAL CARE FACILITIES.

**6.1 General.** Medical care facilities included in this section are those in which people receive physical or medical treatment or care and where persons may need assistance in responding to an emergency and where the period of stay may exceed twenty-four hours. In addition to the requirements of 4.1 through 4.35, medical care facilities and buildings shall comply with 6.

(1) Hospitals - general purpose hospitals, psychiatric facilities, detoxification facilities — At least 10 percent of patient bedrooms and toilets, and all public use and common use areas are required to be designed and constructed to be accessible.

(2) Hospitals and rehabilitation facilities that specialize in treating conditions that affect mobility, or units within either that specialize in treating conditions that affect mobility — All patient bedrooms and toilets, and all public use and common use areas are required to be designed and constructed to be accessible.

(3) Long term care facilities, nursing homes — At least 50 percent of patient bedrooms and toilets, and all public use and common use areas are required to be designed and constructed to be accessible.

(4) Alterations to patient bedrooms.

(a) When patient bedrooms are being added or altered as part of a planned renovation of an entire wing, a department, or other discrete area of an existing medical facility, a percentage of the patient bedrooms that are being added or altered shall comply with 6.3. The percentage of accessible rooms provided shall be consistent with the percentage of rooms required to be accessible by the applicable requirements of 6.1(1), 6.1(2), or 6.1(3), until the number of accessible patient bedrooms in the facility equals the overall number that would be required if the facility were newly constructed. (For example, if 20 patient bedrooms are being altered in the obstetrics department of a hospital, 2 of the altered rooms must be made accessible. If, within the same hospital, 20 patient bedrooms are being altered in a unit that specializes in treating mobility impairments, all of the altered rooms must be made accessible.) Where toilet/bath rooms are part of patient bedrooms which are added or altered and required to be accessible, each such patient toilet/bathroom shall comply with 6.4.

(b) When patient bedrooms are being added or altered individually, and not as part of an alteration of the entire area, the altered patient bedrooms shall comply with 6.3, unless either: a) the number of accessible rooms provided in the department or area containing the altered patient bedroom equals the number of accessible patient bedrooms that would be required if the percentage requirements of 6.1(1), 6.1(2), or 6.1(3) were applied to that department or area; or b) the number of accessible patient bedrooms in the facility equals the overall number that would be required if the facility were newly constructed. Where toilet/bathrooms are part of patient bedrooms which are added or altered and required to be accessible, each such toilet/bathroom shall comply with 6.4.

## 7.0 Business and Mercantile

**6.2 Entrances.** At least one accessible entrance that complies with 4.14 shall be protected from the weather by canopy or roof overhang. Such entrances shall incorporate a passenger loading zone that complies with 4.6.6.

**6.3 Patient Bedrooms.** Provide accessible patient bedrooms in compliance with 4.1 through 4.35. Accessible patient bedrooms shall comply with the following:

(1) Each bedroom shall have a door that complies with 4.13.

**EXCEPTION:** Entry doors to acute care hospital bedrooms for in-patients shall be exempted from the requirement in 4.13.6 for maneuvering space at the latch side of the door if the door is at least 44 in (1120 mm) wide.

(2) Each bedroom shall have adequate space to provide a maneuvering space that complies with 4.2.3. In rooms with 2 beds, it is preferable that this space be located between beds.

(3) Each bedroom shall have adequate space to provide a minimum clear floor space of 36 in (915 mm) along each side of the bed and to provide an accessible route complying with 4.3.3 to each side of each bed.

**6.4 Patient Toilet Rooms.** Where toilet/bath rooms are provided as a part of a patient bedroom, each patient bedroom that is required to be accessible shall have an accessible toilet/bath room that complies with 4.22 or 4.23 and shall be on an accessible route.

## 7. BUSINESS AND MERCANTILE.

**7.1 General.** In addition to the requirements of 4.1 to 4.35, the design of all areas used for business transactions with the public shall comply with 7.

### 7.2 Sales and Service Counters, Teller Windows, Information Counters.

(1) In department stores and miscellaneous retail stores where counters have cash registers and are provided for sales or distribution of goods or services to the public, at least one of each type shall have a portion of the counter which is at least 36 in (915 mm) in length with a maximum height of 36 in (915 mm) above the finish floor. It shall be on an accessible route complying with 4.3. The accessible counters must be dispersed throughout the building or facility. In alterations where it is technically infeasible to provide an accessible counter, an auxiliary counter meeting these requirements may be provided.

(2) At ticketing counters, teller stations in a bank, registration counters in hotels and motels, box office ticket counters, and other counters that may not have a cash register but at which goods or services are sold or distributed, either:

(i) a portion of the main counter which is a minimum of 36 in (915 mm) in length shall be provided with a maximum height of 36 in (915 mm); or

(ii) an auxiliary counter with a maximum height of 36 in (915 mm) in close proximity to the main counter shall be provided; or

(iii) equivalent facilitation shall be provided (e.g., at a hotel registration counter, equivalent facilitation might consist of: (1) provision of a folding shelf attached to the main counter on which an individual with disabilities can write, and (2) use of the space on the side of the counter or at the concierge desk, for handing materials back and forth).

All accessible sales and service counters shall be on an accessible route complying with 4.3.

(3)\* Assistive Listening Devices. (Reserved)

## 8.0 Libraries

### 7.3\* Check-out Aisles.

(1) In new construction, accessible check-out aisles shall be provided in conformance with the table below:

Total Check-out Aisles of Each Design	Minimum Number of Accessible Check-out Aisles (of each design)
1 - 4	1
5 - 8	2
8 - 15	3
over 15	3, plus 20% of additional aisles

EXCEPTION: In new construction, where the selling space is under 5000 square feet, only one check-out aisle is required to be accessible.

EXCEPTION: In alterations, at least one check-out aisle shall be accessible in facilities under 5000 square feet of selling space. In facilities of 5000 or more square feet of selling space, at least one of each design of check-out aisle shall be made accessible when altered until the number of accessible check-out aisles of each design equals the number required in new construction.

Examples of check-out aisles of different "design" include those which are specifically designed to serve different functions. Different "design" includes but is not limited to the following features - length of belt or no belt; or permanent signage designating the aisle as an express lane.

(2) Clear aisle width for accessible check-out aisles shall comply with 4.2.1 and maximum adjoining counter height shall not exceed 38 in (965 mm) above the finish floor. The top of the lip shall not exceed 40 in (1015 mm) above the finish floor.

(3) Signage identifying accessible check-out aisles shall comply with 4.30.7 and shall be mounted above the check-out aisle in the same location where the check-out number or type of check-out is displayed.

**7.4 Security Bollards.** Any device used to prevent the removal of shopping carts from store premises shall not prevent access or egress to people in wheelchairs. An alternate

entry that is equally convenient to that provided for the ambulatory population is acceptable.

## 8. LIBRARIES.

**8.1 General.** In addition to the requirements of 4.1 to 4.35, the design of all public areas of a library shall comply with 8, including reading and study areas, stacks, reference rooms, reserve areas, and special facilities or collections.

**8.2 Reading and Study Areas.** At least 5 percent or a minimum of one of each element of fixed seating, tables, or study carrels shall comply with 4.2 and 4.32. Clearances between fixed accessible tables and between study carrels shall comply with 4.3.

**8.3 Check-Out Areas.** At least one lane at each check-out area shall comply with 7.2(1). Any traffic control or book security gates or turnstiles shall comply with 4.13.

**8.4 Card Catalogs and Magazine Displays.** Minimum clear aisle space at card catalogs and magazine displays shall comply with Fig. 55. Maximum reach height shall comply with 4.2, with a height of 48 in (1220 mm) preferred irrespective of approach allowed.

**8.5 Stacks.** Minimum clear aisle width between stacks shall comply with 4.3, with a minimum clear aisle width of 42 in (1065 mm) preferred where possible. Shelf height in stack areas is unrestricted (see Fig. 56).

## 9.0 Accessible Transient Lodging

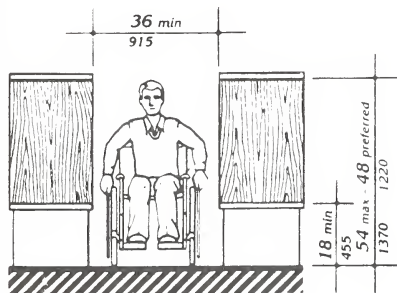


Fig. 55  
Card Catalog

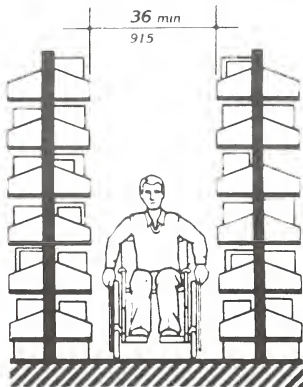


Fig. 56  
Stacks

## 9. ACCESSIBLE TRANSIENT LODGING.

(1) Except as specified in the special technical provisions of this section, accessible transient lodging shall comply with the applicable requirements of 4.1 through 4.35. Transient lodging includes facilities or portions thereof used for sleeping accommodations, when not classed as a medical care facility.

### 9.1 Hotels, Motels, Inns, Boarding Houses, Dormitories, Resorts and Other Similar Places of Transient Lodging.

**9.1.1 General.** All public use and common use areas are required to be designed and constructed to comply with section 4 (Accessible Elements and Spaces: Scope and Technical Requirements).

**EXCEPTION:** Sections 9.1 through 9.4 do not apply to an establishment located within a building that contains not more than five rooms for rent or hire and that is actually occupied by the proprietor of such establishment as the residence of such proprietor.

**9.1.2 Accessible Units, Sleeping Rooms, and Suites.** Accessible sleeping rooms or suites that comply with the requirements of 9.2 (Requirements for Accessible Units, Sleeping Rooms, and Suites) shall be provided in conformance with the table below. In addition, in hotels, of 50 or more sleeping rooms or suites, additional accessible sleeping rooms or suites that include a roll-in shower shall also be provided in conformance with the table below. Such accommodations shall comply with the requirements of 9.2, 4.21, and Figure 57(a) or (b).



### 9.1.3 Sleeping Accommodations for Persons with Hearing Impairments

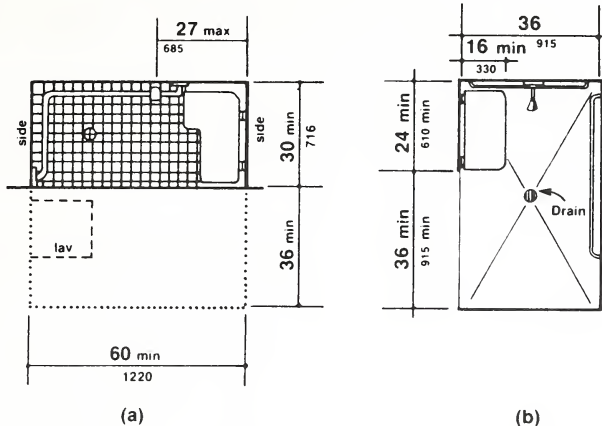


Fig. 57  
Roll-in Shower with Folding Seat

Number of Rooms	Accessible Rooms	Rooms with Roll-in Showers
1 to 25	1	
26 to 50	2	
51 to 75	3	1
76 to 100	4	1
101 to 150	5	2
151 to 200	6	2
201 to 300	7	3
301 to 400	8	4
401 to 500	9	4 plus one for each additional 100 over 400
501 to 1000	2% of total	
1001 and over	20 plus 1 for each 100 over 1000	

**9.1.3 Sleeping Accommodations for Persons with Hearing Impairments.**  
In addition to those accessible sleeping rooms and suites required by 9.1.2, sleeping rooms

and suites that comply with 9.3 (Visual Alarms, Notification Devices, and Telephones) shall be provided in conformance with the following table:

Number of Elements	Accessible Elements
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2% of total
1001 and over	20 plus 1 for each 100 over 1000

## 9.2 Requirements for Accessible Units, Sleeping Rooms and Suites

### 9.1.4 Classes of Sleeping Accommodations.

(1) In order to provide persons with disabilities a range of options equivalent to those available to other persons served by the facility, sleeping rooms and suites required to be accessible by 9.1.2 shall be dispersed among the various classes of sleeping accommodations available to patrons of the place of transient lodging. Factors to be considered include room size, cost, amenities provided, and the number of beds provided.

(2) Equivalent Facilitation. For purposes of this section, it shall be deemed equivalent facilitation if the operator of a facility elects to limit construction of accessible rooms to those intended for multiple occupancy, provided that such rooms are made available at the cost of a single-occupancy room to an individual with disabilities who requests a single-occupancy room.

**9.1.5. Alterations to Accessible Units, Sleeping Rooms, and Suites.** When sleeping rooms are being altered in an existing facility, or portion thereof, subject to the requirements of this section, at least one sleeping room or suite that complies with the requirements of 9.2 (Requirements for Accessible Units, Sleeping Rooms, and Suites) shall be provided for each 25 sleeping rooms, or fraction thereof, of rooms being altered until the number of such rooms provided equals the number required to be accessible with 9.1.2. In addition, at least one sleeping room or suite that complies with the requirements of 9.3 (Visual Alarms, Notification Devices, and Telephones) shall be provided for each 25 sleeping rooms, or fraction thereof, of rooms being altered until the number of such rooms equals the number required to be accessible by 9.1.3.

### 9.2 Requirements for Accessible Units, Sleeping Rooms and Suites.

**9.2.1 General.** Units, sleeping rooms, and suites required to be accessible by 9.1 shall comply with 9.2.

**9.2.2 Minimum Requirements.** An accessible unit, sleeping room or suite shall be on an

accessible route complying with 4.3 and have the following accessible elements and spaces.

(1) Accessible sleeping rooms shall have a 36 in (915 mm) clear width maneuvering space located along both sides of a bed, except that where two beds are provided, this requirement can be met by providing a 36 in (915 mm) wide maneuvering space located between the two beds.

(2) An accessible route complying with 4.3 shall connect all accessible spaces and elements, including telephones, within the unit, sleeping room, or suite. This is not intended to require an elevator in multi-story units as long as the spaces identified in 9.2.2(6) and (7) are on accessible levels and the accessible sleeping area is suitable for dual occupancy.

(3) Doors and doorways designed to allow passage into and within all sleeping rooms, suites or other covered units shall comply with 4.13.

(4) If fixed or built-in storage facilities such as cabinets, shelves, closets, and drawers are provided in accessible spaces, at least one of each type provided shall contain storage space complying with 4.25. Additional storage may be provided outside of the dimensions required by 4.25.

(5) All controls in accessible units, sleeping rooms, and suites shall comply with 4.27.

(6) Where provided as part of an accessible unit, sleeping room, or suite, the following spaces shall be accessible and shall be on an accessible route:

- (a) the living area.
- (b) the dining area.
- (c) at least one sleeping area.
- (d) patios, terraces, or balconies.

**EXCEPTION:** The requirements of 4.13.8 and 4.3.8 do not apply where it is necessary to utilize a higher door threshold or a change in level to protect the integrity of the unit from wind/water damage. Where this exception results in patios, terraces or balconies that are not at an accessible level, equivalent facilitation

### 9.3 Visual Alarms, Notification Devices and Telephones

shall be provided. [E.g., equivalent facilitation at a hotel patio or balcony might consist of providing raised decking or a ramp to provide accessibility.)

(e) at least one full bathroom (i.e., one with a water closet, a lavatory, and a bathtub or shower).

(f) If only half baths are provided, at least one half bath.

(g) carports, garages or parking spaces.

(7) Kitchens, Kitchenettes, or Wet Bars. When provided as accessory to a sleeping room or suite, kitchens, kitchenettes, wet bars, or similar amenities shall be accessible. Clear floor space for a front or parallel approach to cabinets, counters, sinks, and appliances shall be provided to comply with 4.2.4. Countertops and sinks shall be mounted at a maximum height of 34 in (865 mm) above the floor. At least fifty percent of shelf space in cabinets or refrigerator/freezers shall be within the reach ranges of 4.2.5 or 4.2.6 and space shall be designed to allow for the operation of cabinet and/or appliance doors so that all cabinets and appliances are accessible and usable. Controls and operating mechanisms shall comply with 4.2.7.

(8) Sleeping room accommodations for persons with hearing impairments required by 9.1 and complying with 9.3 shall be provided in the accessible sleeping room or suite.

#### 9.3 Visual Alarms, Notification Devices and Telephones.

**9.3.1 General.** In sleeping rooms required to comply with this section, auxiliary visual alarms shall be provided and shall comply with 4.28.4. Visual notification devices shall also be provided in units, sleeping rooms and suites to alert room occupants of incoming telephone calls and a door knock or bell. Notification devices shall not be connected to auxiliary visual alarm signal appliances. Permanently installed telephones shall have volume controls complying with 4.31.5; an accessible electrical outlet within 4 ft (1220 mm) of a telephone connection shall be provided to facilitate the use of a text telephone.

**9.3.2 Equivalent Facilitation.** For purposes of this section, equivalent facilitation shall include the installation of electrical outlets (including outlets connected to a facility's central alarm system) and telephone wiring in sleeping rooms and suites to enable persons with hearing impairments to utilize portable visual alarms and communication devices provided by the operator of the facility.

**9.4 Other Sleeping Rooms and Suites.** Doors and doorways designed to allow passage into and within all sleeping units or other covered units shall comply with 4.13.5.

#### 9.5 Transient Lodging in Homeless Shelters, Halfway Houses, Transient Group Homes, and Other Social Service Establishments.

**9.5.1 New Construction.** In new construction all public use and common use areas are required to be designed and constructed to comply with section 4. At least one of each type of amenity (such as washers, dryers and similar equipment installed for the use of occupants) in each common area shall be accessible and shall be located on an accessible route to any accessible unit or sleeping accommodation.

EXCEPTION: Where elevators are not provided as allowed in 4.1.3(5), accessible amenities are not required on inaccessible floors as long as one of each type is provided in common areas on accessible floors.

#### 9.5.2 Alterations.

(1) Social service establishments which are not homeless shelters:

(a) The provisions of 9.5.3 and 9.1.5 shall apply to sleeping rooms and beds.

(b) Alteration of other areas shall be consistent with the new construction provisions of 9.5.1.

(2) Homeless shelters. If the following elements are altered, the following requirements apply:



## 10.0 Transportation Facilities

(a) at least one public entrance shall allow a person with mobility impairments to approach, enter and exit including a minimum clear door width of 32 in (815 mm).

(b) sleeping space for homeless persons as provided in the scoping provisions of 9.1.2 shall include doors to the sleeping area with a minimum clear width of 32 in (815 mm) and maneuvering space around the beds for persons with mobility impairments complying with 9.2.2(1).

(c) at least one toilet room for each gender or one unisex toilet room shall have a minimum clear door width of 32 in (815 mm), minimum turning space complying with 4.2.3, one water closet complying with 4.16, one lavatory complying with 4.19 and the door shall have a privacy latch; and, if provided, at least one tub or shower shall comply with 4.20 or 4.21, respectively.

(d) at least one common area which a person with mobility impairments can approach, enter and exit including a minimum clear door width of 32 in (815 mm).

(e) at least one route connecting elements (a), (b), (c) and (d) which a person with mobility impairments can use including minimum clear width of 36 in (915 mm), passing space complying with 4.3.4, turning space complying with 4.2.3 and changes in levels complying with 4.3.8.

(f) homeless shelters can comply with the provisions of (a)-(e) by providing the above elements on one accessible floor.

### 9.5.3. Accessible Sleeping

#### Accommodations in New Construction.

Accessible sleeping rooms shall be provided in conformance with the table in 9.1.2 and shall comply with 9.2 Accessible Units, Sleeping Rooms and Suites (where the items are provided). Additional sleeping rooms that comply with 9.3 Sleeping Accommodations for Persons with Hearing Impairments shall be provided in conformance with the table provided in 9.1.3.

In facilities with multi-bed rooms or spaces, a percentage of the beds equal to the table provided in 9.1.2 shall comply with 9.2.2(1).

## 10. TRANSPORTATION FACILITIES.

**10.1 General.** Every station, bus stop, bus stop pad, terminal, building or other transportation facility, shall comply with the applicable provisions of 4.1 through 4.35, sections 5 through 9, and the applicable provisions of this section. The exceptions for elevators in 4.1.3(5), exception 1 and 4.1.6(1)(k) do not apply to a terminal, depot, or other station used for specified public transportation, or an airport passenger terminal, or facilities subject to Title II.

### 10.2 Bus Stops and Terminals.

#### 10.2.1 New Construction.

(1) Where new bus stop pads are constructed at bus stops, bays or other areas where a lift or ramp is to be deployed, they shall have a firm, stable surface: a minimum clear length of 96 inches (measured from the curb or vehicle roadway edge) and a minimum clear width of 60 inches (measured parallel to the vehicle roadway) to the maximum extent allowed by legal or site constraints; and shall be connected to streets, sidewalks or pedestrian paths by an accessible route complying with 4.3 and 4.4. The slope of the pad parallel to the roadway shall, to the extent practicable, be the same as the roadway. For water drainage, a maximum slope of 1:50 (2%) perpendicular to the roadway is allowed.

(2) Where provided, new or replaced bus shelters shall be installed or positioned so as to permit a wheelchair or mobility aid user to enter from the public way and to reach a location, having a minimum clear floor area of 30 inches by 48 inches, entirely within the perimeter of the shelter. Such shelters shall be connected by an accessible route to the boarding area provided under paragraph (1) of this section.

(3) Where provided, all new bus route identification signs shall comply with 4.30.5. In addition, to the maximum extent practicable, all new bus route identification signs shall comply with 4.30.2 and 4.30.3. Signs

### 10.3 Fixed Facilities and Stations

that are sized to the maximum dimensions permitted under legitimate local, state or federal regulations or ordinances shall be considered in compliance with 4.30.2 and 4.30.3 for purposes of this section.

**EXCEPTION:** Bus schedules, timetables, or maps that are posted at the bus stop or bus bay are not required to comply with this provision.

#### 10.2.2 Bus Stop Siting and Alterations.

(1) Bus stop sites shall be chosen such that, to the maximum extent practicable, the areas where lifts or ramps are to be deployed comply with section 10.2.1(1) and (2).

(2) When new bus route identification signs are installed or old signs are replaced, they shall comply with the requirements of 10.2.1(3).

### 10.3 Fixed Facilities and Stations.

**10.3.1 New Construction.** New stations in rapid rail, light rail, commuter rail, intercity bus, intercity rail, high speed rail, and other fixed guideway systems (e.g., automated guideway transit, monorails, etc.) shall comply with the following provisions, as applicable:

(1) Elements such as ramps, elevators or other circulation devices, fare vending or other ticketing areas, and fare collection areas shall be placed to minimize the distance which wheelchair users and other persons who cannot negotiate steps may have to travel compared to the general public. The circulation path, including an accessible entrance and an accessible route, for persons with disabilities shall, to the maximum extent practicable, coincide with the circulation path for the general public. Where the circulation path is different, signage complying with 4.30.1, 4.30.2, 4.30.3, 4.30.5, and 4.30.7(1) shall be provided to indicate direction to and identify the accessible entrance and accessible route.

(2) In lieu of compliance with 4.1.3(8), at least one entrance to each station shall comply with 4.14, Entrances. If different entrances to a station serve different transportation fixed routes or groups of fixed routes, at least one entrance serving each group or route shall

comply with 4.14, Entrances. All accessible entrances shall, to the maximum extent practicable, coincide with those used by the majority of the general public.

(3) Direct connections to commercial, retail, or residential facilities shall have an accessible route complying with 4.3 from the point of connection to boarding platforms and all transportation system elements used by the public. Any elements provided to facilitate future direct connections shall be on an accessible route connecting boarding platforms and all transportation system elements used by the public.

(4) Where signs are provided at entrances to stations identifying the station or the entrance, or both, at least one sign at each entrance shall comply with 4.30.4 and 4.30.6. Such signs shall be placed in uniform locations at entrances within the transit system to the maximum extent practicable.

**EXCEPTION:** Where the station has no defined entrance, but signage is provided, then the accessible signage shall be placed in a central location.

(5) Stations covered by this section shall have identification signs complying with 4.30.1, 4.30.2, 4.30.3, and 4.30.5. Signs shall be placed at frequent intervals and shall be clearly visible from within the vehicle on both sides when not obstructed by another train. When station identification signs are placed close to vehicle windows (i.e., on the side opposite from boarding) each shall have the top of the highest letter or symbol below the top of the vehicle window and the bottom of the lowest letter or symbol above the horizontal mid-line of the vehicle window.

(6) Lists of stations, routes, or destinations served by the station and located on boarding areas, platforms, or mezzanines shall comply with 4.30.1, 4.30.2, 4.30.3, and 4.30.5. A minimum of one sign identifying the specific station and complying with 4.30.4 and 4.30.6 shall be provided on each platform or boarding area. All signs referenced in this paragraph shall, to the maximum extent practicable, be placed in uniform locations within the transit system.

**10.3 Fixed Facilities and Stations**

(7)\* Automatic fare vending, collection and adjustment (e.g., add-fare) systems shall comply with 4.34.2, 4.34.3, and 4.34.4. At each accessible entrance such devices shall be located on an accessible route. If self-service fare collection devices are provided for the use of the general public, at least one accessible device for entering, and at least one for exiting, unless one device serves both functions, shall be provided at each accessible point of entry or exit. Accessible fare collection devices shall have a minimum clear opening width of 32 inches; shall permit passage of a wheelchair; and, where provided, coin or card slots and controls necessary for operation shall comply with 4.27. Gates which must be pushed open by wheelchair or mobility aid users shall have a smooth continuous surface extending from 2 inches above the floor to 27 inches above the floor and shall comply with 4.13. Where the circulation path does not coincide with that used by the general public, accessible fare collection systems shall be located at or adjacent to the accessible point of entry or exit.

(8) Platform edges bordering a drop-off and not protected by platform screens or guard rails shall have a detectable warning. Such detectable warnings shall comply with 4.29.2 and shall be 24 inches wide running the full length of the platform drop-off.

(9) In stations covered by this section, rail-to-platform height in new stations shall be coordinated with the floor height of new vehicles so that the vertical difference, measured when the vehicle is at rest, is within plus or minus 5/8 inch under normal passenger load conditions. For rapid rail, light rail, commuter rail, high speed rail, and intercity rail systems in new stations, the horizontal gap, measured when the new vehicle is at rest, shall be no greater than 3 inches. For slow moving automated guideway "people mover" transit systems, the horizontal gap in new stations shall be no greater than 1 inch.

**EXCEPTION 1:** Existing vehicles operating in new stations may have a vertical difference with respect to the new platform within plus or minus 1-1/2 inches.

**EXCEPTION 2:** In light rail, commuter rail and intercity rail systems where it is not operation-

ally or structurally feasible to meet the horizontal gap or vertical difference requirements, mini-high platforms, car-borne or platform-mounted lifts, ramps or bridge plates, or similar manually deployed devices, meeting the applicable requirements of 36 CFR part 1192, or 49 CFR part 38 shall suffice.

(10) Stations shall not be designed or constructed so as to require persons with disabilities to board or alight from a vehicle at a location other than one used by the general public.

(11) Illumination levels in the areas where signage is located shall be uniform and shall minimize glare on signs. Lighting along circulation routes shall be of a type and configuration to provide uniform illumination.

(12) Text Telephones: The following shall be provided in accordance with 4.31.9:

(a) If an interior public pay telephone is provided in a transit facility (as defined by the Department of Transportation) at least one interior public text telephone shall be provided in the station.

(b) Where four or more public pay telephones serve a particular entrance to a rail station and at least one is in an interior location, at least one interior public text telephone shall be provided to serve that entrance. Compliance with this section constitutes compliance with section 4.1.3(17)(c).

(13) Where it is necessary to cross tracks to reach boarding platforms, the route surface shall be level and flush with the rail top at the outer edge and between the rails, except for a maximum 2-1/2 inch gap on the inner edge of each rail to permit passage of wheel flanges. Such crossings shall comply with 4.29.5. Where gap reduction is not practicable, an above-grade or below-grade accessible route shall be provided.

(14) Where public address systems are provided to convey information to the public in terminals, stations, or other fixed facilities, a means of conveying the same or equivalent information to persons with hearing loss or who are deaf shall be provided.

### 10.3.2 Existing Facilities: Key Stations.

(15) Where clocks are provided for use by the general public, the clock face shall be uncluttered so that its elements are clearly visible. Hands, numerals, and/or digits shall contrast with the background either light-on-dark or dark-on-light. Where clocks are mounted overhead, numerals and/or digits shall comply with 4.30.3. Clocks shall be placed in uniform locations throughout the facility and system to the maximum extent practicable.

(16) Where provided in below grade stations, escalators shall have a minimum clear width of 32 inches. At the top and bottom of each escalator run, at least two contiguous treads shall be level beyond the comb plate before the risers begin to form. All escalator treads shall be marked by a strip of clearly contrasting color, 2 inches in width, placed parallel to and on the nose of each step. The strip shall be of a material that is at least as slip resistant as the remainder of the tread. The edge of the tread shall be apparent from both ascending and descending directions.

(17) Where provided, elevators shall be glazed or have transparent panels to allow an unobstructed view both in to and out of the car. Elevators shall comply with 4.10.

EXCEPTION: Elevator cars with a clear floor area in which a 60 inch diameter circle can be inscribed may be substituted for the minimum car dimensions of 4.10, Fig. 22.

(18) Where provided, ticketing areas shall permit persons with disabilities to obtain a ticket and check baggage and shall comply with 7.2.

(19) Where provided, baggage check-in and retrieval systems shall be on an accessible route complying with 4.3, and shall have space immediately adjacent complying with 4.2. If unattended security barriers are provided, at least one gate shall comply with 4.13. Gates which must be pushed open by wheelchair or mobility aid users shall have a smooth continuous surface extending from 2 inches above the floor to 27 inches above the floor.

### 10.3.2 Existing Facilities: Key Stations.

(1) Rapid, light and commuter rail key stations, as defined under criteria established by the Department of Transportation in subpart C of 49 CFR part 37 and existing intercity rail stations shall provide at least one accessible route from an accessible entrance to those areas necessary for use of the transportation system.

(2) The accessible route required by 10.3.2(1) shall include the features specified in 10.3.1(1), (4)-(9), (11)-(15), and (17)-(19).

(3) Where technical infeasibility in existing stations requires the accessible route to lead from the public way to a paid area of the transit system, an accessible fare collection system, complying with 10.3.1(7), shall be provided along such accessible route.

(4) In light rail, rapid rail and commuter rail key stations, the platform or a portion thereof and the vehicle floor shall be coordinated so that the vertical difference, measured when the vehicle is at rest, within plus or minus 1-1/2 inches under all normal passenger load conditions, and the horizontal gap, measured when the vehicle is at rest, is no greater than 3 inches for at least one door of each vehicle or car required to be accessible by 49 CFR part 37.

EXCEPTION 1: Existing vehicles retrofitted to meet the requirements of 49 CFR 37.93 (one-car-per-train rule) shall be coordinated with the platform such that, for at least one door, the vertical difference between the vehicle floor and the platform, measured when the vehicle is at rest with 50% normal passenger capacity, is within plus or minus 2 inches and the horizontal gap is no greater than 4 inches.

EXCEPTION 2: Where it is not structurally or operationally feasible to meet the horizontal gap or vertical difference requirements, mini-high platforms, car-borne or platform mounted lifts, ramps or bridge plates, or similar manually deployed devices, meeting the applicable requirements of 36 CFR Part 1192 shall suffice.

## 10.4 Airports

(5) New direct connections to commercial, retail, or residential facilities shall, to the maximum extent feasible, have an accessible route complying with 4.3 from the point of connection to boarding platforms and all transportation system elements used by the public. Any elements provided to facilitate future direct connections shall be on an accessible route connecting boarding platforms and all transportation system elements used by the public.

### 10.3.3 Existing Facilities: Alterations.

(1) For the purpose of complying with 4.1.6(2) Alterations to an Area Containing a Primary Function, an area of primary function shall be as defined by applicable provisions of 49 CFR 37.43(c) (Department of Transportation's ADA Rule) or 28 CFR 36.403 (Department of Justice's ADA Rule).

## 10.4. Airports.

### 10.4.1 New Construction.

(1) Elements such as ramps, elevators or other vertical circulation devices, ticketing areas, security checkpoints, or passenger waiting areas shall be placed to minimize the distance which wheelchair users and other persons who cannot negotiate steps may have to travel compared to the general public.

(2) The circulation path, including an accessible entrance and an accessible route, for persons with disabilities shall, to the maximum extent practicable, coincide with the circulation path for the general public. Where the circulation path is different, directional signage complying with 4.30.1, 4.30.2, 4.30.3 and 4.30.5 shall be provided which indicates the location of the nearest accessible entrance and its accessible route.

(3) Ticketing areas shall permit persons with disabilities to obtain a ticket and check baggage and shall comply with 7.2.

(4) Where public pay telephones are provided, and at least one is at an interior location, a public text telephone shall be provided in compliance with 4.31.9. Additionally, if four or more public pay telephones are located

in any of the following locations, at least one public text telephone shall also be provided in that location:

- (a) a main terminal outside the security areas;
- (b) a concourse within the security areas; or
- (c) a baggage claim area in a terminal.

Compliance with this section constitutes compliance with section 4.1.3(17)(c).

(5) Baggage check-in and retrieval systems shall be on an accessible route complying with 4.3, and shall have space immediately adjacent complying with 4.2.4. If unattended security barriers are provided, at least one gate shall comply with 4.13. Gates which must be pushed open by wheelchair or mobility aid users shall have a smooth continuous surface extending from 2 inches above the floor to 27 inches above the floor.

(6) Terminal information systems which broadcast information to the general public through a public address system shall provide a means to provide the same or equivalent information to persons with a hearing loss or who are deaf. Such methods may include, but are not limited to, visual paging systems using video monitors and computer technology. For persons with certain types of hearing loss such methods may include, but are not limited to, an assistive listening system complying with 4.33.7.

(7) Where clocks are provided for use by the general public the clock face shall be uncluttered so that its elements are clearly visible. Hands, numerals, and/or digits shall contrast with their background either light-on-dark or dark-on-light. Where clocks are mounted overhead, numerals and/or digits shall comply with 4.30.3. Clocks shall be placed in uniform locations throughout the facility to the maximum extent practicable.

(8) Security Systems. [Reserved]

### 10.5 Boat and Ferry Docks. [Reserved]



## Appendix

## APPENDIX

This appendix contains materials of an advisory nature and provides additional information that should help the reader to understand the minimum requirements of the guidelines or to design buildings or facilities for greater accessibility. The paragraph numbers correspond to the sections or paragraphs of the guideline to which the material relates and are therefore not consecutive (for example, A4.2.1 contains additional information relevant to 4.2.1). Sections of the guidelines for which additional material appears in this appendix have been indicated by an asterisk. *Nothing in this appendix shall in any way obviate any obligation to comply with the requirements of the guidelines itself.*

**A4.2 Equivalent Facilitation.** Specific examples of equivalent facilitation are found in the following sections:

- |             |  |
|-------------|--|
| 4.1.6(3)(c) | Elevators in Alterations   |
| 4.31.9      | Text Telephones  |
| 7.2         | Sales and Service<br>Counters, Teller Windows,<br>Information Counters |
| 9.1.4       | Classes of Sleeping<br>Accommodations                                  |
| 9.2.2(6)(d) | Requirements for Accessible<br>Units, Sleeping Rooms, and<br>Suites    |

#### A4.1.1 Application.

**A4.1.1(3) Areas Used Only by Employees as Work Areas.** Where there are a series of individual work stations of the same type (e.g., laboratories, service counters, ticket booths), 5%, but not less than one, of each type of work station should be constructed so that an individual with disabilities can maneuver within the work stations. Rooms housing individual offices in a typical office building must meet the requirements of the guidelines concerning doors, accessible routes, etc. but do not need to allow for maneuvering space around individual desks. Modifications required to permit maneuvering within the work area may be accomplished as a reasonable accommodation to individual employees with disabilities under Title I of the ADA. Consideration should also be given to placing shelves in employee work areas at a

convenient height for accessibility or installing commercially available shelving that is adjustable so that reasonable accommodations can be made in the future.

If work stations are made accessible they should comply with the applicable provisions of 4.2 through 4.35.

#### A4.1.2 Accessible Sites and Exterior Facilities: New Construction.

**A4.1.2(5)(e) Valet Parking.** Valet parking is not always usable by individuals with disabilities. For instance, an individual may use a type of vehicle controls that render the regular controls inoperable or the driver's seat in a van may be removed. In these situations, another person cannot park the vehicle. It is recommended that some self-parking spaces be provided at valet parking facilities for individuals whose vehicles cannot be parked by another person and that such spaces be located on an accessible route to the entrance of the facility.

#### A4.1.3 Accessible Buildings: New Construction.

**A4.1.3(5)** Only full passenger elevators are covered by the accessibility provisions of 4.10. Materials and equipment hoists, freight elevators not intended for passenger use, dumbwaiters, and construction elevators are not covered by these guidelines. If a building is exempt from the elevator requirement, it is not necessary to provide a platform lift or other means of vertical access in lieu of an elevator.

Under Exception 4, platform lifts are allowed where existing conditions make it impractical to install a ramp or elevator. Such conditions generally occur where it is essential to provide access to small raised or lowered areas where space may not be available for a ramp. Examples include, but are not limited to, raised pharmacy platforms, commercial offices raised above a sales floor, or radio and news booths.

**A4.1.3(9)** Supervised automatic sprinkler systems have built in signals for monitoring features of the system such as the opening and closing of water control valves, the power supplies for needed pumps, water tank levels, and for indicating conditions that will impair the satisfactory operation of the sprinkler system.

## A4.2 Space Allowances and Reach Ranges

*Because of these monitoring features, supervised automatic sprinkler systems have a high level of satisfactory performance and response to fire conditions.*

**A4.1.3(10)** If an odd number of drinking fountains is provided on a floor, the requirement in 4.1.3(10)(b) may be met by rounding down the odd number to an even number and calculating 50% of the even number. When more than one drinking fountain on a floor is required to comply with 4.15, those fountains should be dispersed to allow wheelchair users convenient access. For example, in a large facility such as a convention center that has water fountains at several locations on a floor, the accessible water fountains should be located so that wheelchair users do not have to travel a greater distance than other people to use a drinking fountain.

**A4.1.3(17)(b)** In addition to the requirements of section 4.1.3(17)(b), the installation of additional volume controls is encouraged. Volume controls may be installed on any telephone.

**A4.1.3(19)(a)** Readily removable or folding seating units may be installed in lieu of providing an open space for wheelchair users. Folding seating units are usually two fixed seats that can be easily folded into a fixed center bar to allow for one or two open spaces for wheelchair users when necessary. These units are more easily adapted than removable seats which generally require the seat to be removed in advance by the facility management.

Either a sign or a marker placed on seating with removable or folding arm rests is required by this section. Consideration should be given for ensuring identification of such seats in a darkened theater. For example, a marker which contrasts (light on dark or dark on light) and which also reflects light could be placed on the side of such seating so as to be visible in a lighted auditorium and also to reflect light from a flashlight.

### A4.1.6 Accessible Buildings: Alterations.

**A4.1.6(1)(h)** When an entrance is being altered, it is preferable that those entrances being altered be made accessible to the extent feasible.

## A4.2 Space Allowances and Reach Ranges

### A4.2.1 Wheelchair Passage Width.

(1) Space Requirements for Wheelchairs. Many persons who use wheelchairs need a 30 in (760 mm) clear opening width for doorways, gates, and the like, when the latter are entered head-on. If the person is unfamiliar with a building, if competing traffic is heavy, if sudden or frequent movements are needed, or if the wheelchair must be turned at an opening, then greater clear widths are needed. For most situations, the addition of an inch of leeway on either side is sufficient. Thus, a minimum clear width of 32 in (815 mm) will provide adequate clearance. However, when an opening or a restriction in a passageway is more than 24 in (610 mm) long, it is essentially a passageway and must be at least 36 in (915 mm) wide.

(2) Space Requirements for Use of Walking Aids. Although people who use walking aids can maneuver through clear width openings of 32 in (815 mm), they need 36 in (915 mm) wide passageways and walks for comfortable gaits. Crutch tips, often extending down at a wide angle, are a hazard in narrow passageways where they might not be seen by other pedestrians. Thus, the 36 in (915 mm) width provides a safety allowance both for the person with a disability and for others.

(3) Space Requirements for Passing. Able-bodied persons in winter clothing, walking

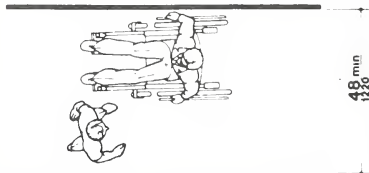


Fig. A1  
Minimum Passage Width for One Wheelchair  
and One Ambulatory Person

## A4.2 Space Allowances and Reach Ranges

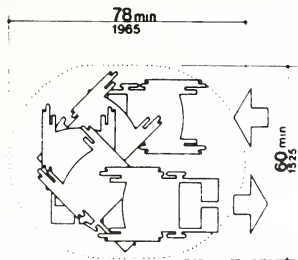
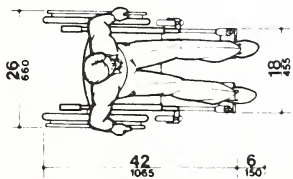
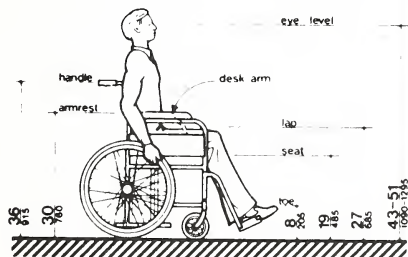


Fig. A2

Space Needed for Smooth U-Turn in a Wheelchair



NOTE: Footrests may extend further for tall people

Fig. A3

Dimensions of Adult-Sized Wheelchairs

straight ahead with arms swinging, need 32 in (815 mm) of width, which includes 2 in (50 mm) on either side for sway, and another 1 in (25 mm) tolerance on either side for clearing nearby objects or other pedestrians. Almost all wheelchair users and those who use walking aids can also manage within this 32 in (815 mm) width for short distances. Thus, two streams of traffic can pass in 64 in (1625 mm) in a comfortable flow. Sixty inches (1525 mm) provides a minimum width for a somewhat more restricted flow. If the clear width is less than 60 in (1525 mm), two wheelchair users will not be able to pass but will have to seek a wider place for passing. Forty-eight inches (1220 mm) is the minimum width needed for an ambulatory person to pass a nonambulatory or semi-ambulatory person. Within this 48 in (1220 mm) width, the ambulatory person will have to twist to pass a wheelchair user, a person with a *service animal*, or a

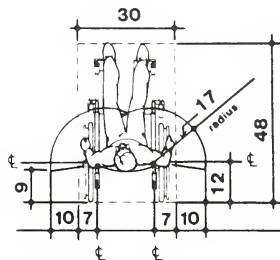
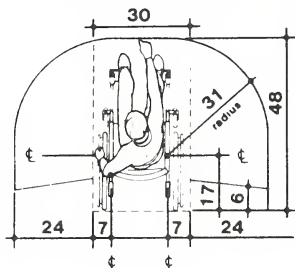


Fig. A3 (a)



### A4.3 Accessible Route

semi-ambulatory person. There will be little leeway for swaying or missteps (see Fig. A1).

#### A4.2.3 Wheelchair Turning Space.

*These guidelines specify a minimum space of 60 in (1525 mm) diameter or a 60 in by 60 in (1525 mm by 1525 mm) T-shaped space for a pivoting 180-degree turn of a wheelchair. This space is usually satisfactory for turning around, but many people will not be able to turn without repeated tries and bumping into surrounding objects. The space shown in Fig. A2 will allow most wheelchair users to complete U-turns without difficulty.*

#### A4.2.4 Clear Floor or Ground Space for Wheelchairs.

The wheelchair and user shown in Fig. A3 represent typical dimensions for a large adult male. The space requirements in this guideline are based upon maneuvering clearances that will accommodate most wheelchairs. Fig. A3 provides a uniform reference for design not covered by this guideline.

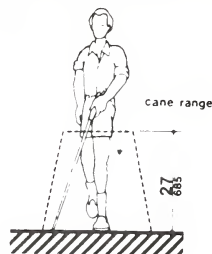
**A4.2.5 & A4.2.6 Reach.** Reach ranges for persons seated in wheelchairs may be further clarified by Fig. A3(a). These drawings approximate in the plan view the information shown in Fig. 4, 5, and 6.

### A4.3 Accessible Route.

#### A4.3.1 General.

(1) **Travel Distances.** Many people with mobility impairments can move at only very slow speeds; for many, traveling 200 ft (61 m) could take about 2 minutes. This assumes a rate of about 1.5 ft/s (455 mm/s) on level ground. It also assumes that the traveler would move continuously. However, on trips over 100 ft (30 m), disabled people are apt to rest frequently, which substantially increases their trip times. Resting periods of 2 minutes for every 100 ft (30 m) can be used to estimate travel times for people with severely limited stamina. In inclement weather, slow progress and resting can greatly increase a disabled person's exposure to the elements.

(2) **Sites.** Level, indirect routes or those with running slopes lower than 1:20 can sometimes provide more convenience than direct routes with maximum allowable slopes or with ramps.



60" 150"

60" 150"

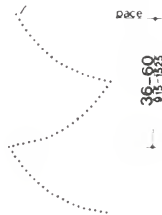


Fig. A4  
Cane Technique

**A4.3.10 Egress.** Because people with disabilities may visit, be employed or be a resident in any building, emergency management plans with specific provisions to ensure their safe evacuation also play an essential role in fire safety and life safety.

**A4.3.11.3 Stairway Width.** A 48 inch (1220 mm) wide exit stairway is needed to allow assisted evacuation (e.g., carrying a person in a wheelchair) without encroaching on the exit path for ambulatory persons.

## A4.5 Ground and Floor Surfaces

**A4.3.1.4 Two-way Communication.** *It is essential that emergency communication not be dependent on voice communications alone because the safety of people with hearing or speech impairments could be jeopardized. The visible signal requirement could be satisfied with something as simple as a button in the area of rescue assistance that lights, indicating that help is on the way, when the message is answered at the point of entry.*

## A4.4 Protruding Objects.

**A4.4.1 General.** *Service animals are trained to recognize and avoid hazards. However, most people with severe impairments of vision use the long cane as an aid to mobility. The two principal cane techniques are the touch technique, where the cane arcs from side to side and touches points outside both shoulders; and the diagonal technique, where the cane is held in a stationary position diagonally across the body with the cane tip touching or just above the ground at a point outside one shoulder and the handle or grip extending to a point outside the other shoulder. The touch technique is used primarily in uncontrolled areas, while the diagonal technique is used primarily in certain limited, controlled, and familiar environments. Cane users are often trained to use both techniques.*

Potential hazardous objects are noticed only if they fall within the detection range of canes (see Fig. A4). Visually impaired people walking toward an object can detect an overhang if its lowest surface is not higher than 27 in (685 mm). When walking alongside protruding objects, they cannot detect overhangs. Since proper cane and service animal techniques keep people away from the edge of a path or from walls, a slight overhang of no more than 4 in (100 mm) is not hazardous.

## A4.5 Ground and Floor Surfaces.

**A4.5.1 General.** *People who have difficulty walking or maintaining balance or who use crutches, canes, or walkers, and those with restricted gaits are particularly sensitive to slipping and tripping hazards. For such people, a stable and regular surface is necessary for safe walking, particularly on stairs. Wheelchairs can be propelled most easily on surfaces that are hard, stable, and regular. Soft loose*

*surfaces such as shag carpet, loose sand or gravel, wet clay, and irregular surfaces such as cobblestones can significantly impede wheelchair movement.*

Slip resistance is based on the frictional force necessary to keep a shoe heel or crutch tip from slipping on a walking surface under conditions likely to be found on the surface. While the dynamic coefficient of friction during walking varies in a complex and non-uniform way, the static coefficient of friction, which can be measured in several ways, provides a close approximation of the slip resistance of a surface. Contrary to popular belief, some slippage is necessary to walking, especially for persons with restricted gaits; a truly "non-slip" surface could not be negotiated.

The Occupational Safety and Health Administration recommends that walking surfaces have a static coefficient of friction of 0.5. A research project sponsored by the Architectural and Transportation Barriers Compliance Board (Access Board) conducted tests with persons with disabilities and concluded that a higher coefficient of friction was needed by such persons. A static coefficient of friction of 0.6 is recommended for accessible routes and 0.8 for ramps.

It is recognized that the coefficient of friction varies considerably due to the presence of contaminants, water, floor finishes, and other factors not under the control of the designer or builder and not subject to design and construction guidelines and that compliance would be difficult to measure on the building site. Nevertheless, many common building materials suitable for flooring are now labeled with information on the static coefficient of friction. While it may not be possible to compare one product directly with another, or to guarantee a constant measure, builders and designers are encouraged to specify materials with appropriate values. As more products include information on slip resistance, improved uniformity in measurement and specification is likely. The Access Board's advisory guidelines on Slip Resistant Surfaces provides additional information on this subject.

Cross slopes on walks and ground or floor surfaces can cause considerable difficulty in propelling a wheelchair in a straight line.

## A4.6 Parking and Passenger Loading Zones

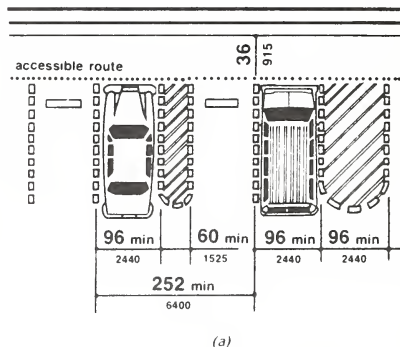
**A4.5.3 Carpet.** Much more needs to be done in developing both quantitative and qualitative criteria for carpeting (i.e., problems associated with texture and weave need to be studied). However, certain functional characteristics are well established. When both carpet and padding are used, it is desirable to have minimum movement (preferably none) between the floor and the pad and the carpet which would allow the carpet to hump or warp. In heavily trafficked areas, a thick, soft (plush) pad or cushion, particularly in combination with long carpet pile, makes it difficult for individuals in wheelchairs and those with other ambulatory disabilities to get about. Firm carpeting can be achieved through proper selection and combination of pad and carpet, sometimes with the elimination of the pad or cushion, and with proper installation. Carpeting designed with a weave that causes a zig-zag effect when wheeled across is strongly discouraged.

## A4.6 Parking and Passenger Loading Zones.

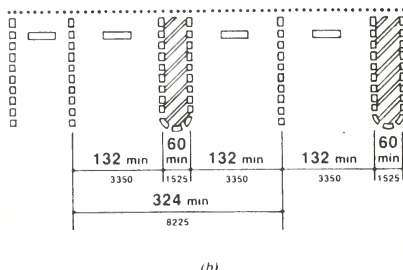
**A4.6.3 Parking Spaces.** The increasing use of vans with side-mounted lifts or ramps by persons with disabilities has necessitated some revisions in specifications for parking spaces and adjacent access aisles. The typical accessible parking space is 96 in (2440 mm) wide with an adjacent 60 in (1525 mm) access aisle. However, this aisle does not permit lifts or ramps to be deployed and still leave room for a person using a wheelchair or other mobility aid to exit the lift platform or ramp. In tests conducted with actual lift/van/wheelchair combinations, (under a Board-sponsored Accessible Parking and Loading Zones Project) researchers found that a space and aisle totaling almost 204 in (5180 mm) wide was needed to deploy a lift and exit conveniently. The "van accessible" parking space required by these guidelines provides a 96 in (2440 mm) wide space with a 96 in (2440 mm) adjacent access aisle which is just wide enough to maneuver and exit from a side mounted lift. If a 96 in (2440 mm) access aisle is placed between two spaces, two "van accessible" spaces are created. Alternatively, if the wide access aisle is provided at the end of a row (an area often unused), it may be possible to provide the wide access aisle without additional space (see Fig. A5(a)).

A sign is needed to alert van users to the presence of the wider aisle, but the space is not intended to be restricted only to vans.

**"Universal" Parking Space Design.** An alternative to the provision of a percentage of spaces with a wide aisle, and the associated need to include additional signage, is the use of what has been called the "universal" parking space design. Under this design, all accessible spaces are 132 in (3350 mm) wide with a 60 in (1525 mm) access aisle (see Fig. A5(b)). One



Van Accessible Space at End Row



Universal Parking Space Design

Fig. A5  
Parking Space Alternatives

**A4.8 Ramps**

*advantage to this design is that no additional signage is needed because all spaces can accommodate a van with a side-mounted lift or ramp. Also, there is no competition between cars and vans for spaces since all spaces can accommodate either. Furthermore, the wider space permits vehicles to park to one side or the other within the 132 in (3350 mm) space to allow persons to exit and enter the vehicle on either the driver or passenger side, although, in some cases, this would require exiting or entering without a marked access aisle.*

*An essential consideration for any design is having the access aisle level with the parking space. Since a person with a disability, using a lift or ramp, must maneuver within the access aisle, the aisle cannot include a ramp or sloped area. The access aisle must be connected to an accessible route to the appropriate accessible entrance of a building or facility. The parking access aisle must either blend with the accessible route or have a curb ramp complying with 4.7. Such a curb ramp opening must be located within the access aisle boundaries, not within the parking space boundaries. Unfortunately, many facilities are designed with a ramp that is blocked when any vehicle parks in the accessible space. Also, the required dimensions of the access aisle cannot be restricted by planters, curbs or wheel stops.*

**A4.6.4 Signage.** Signs designating parking places for disabled people can be seen from a driver's seat if the signs are mounted high enough above the ground and located at the front of a parking space.

**A4.6.5 Vertical Clearance.** High-top vans, which disabled people or transportation services often use, require higher clearances in parking garages than automobiles.

**A4.8 Ramps.**

**A4.8.1 General.** Ramps are essential for wheelchair users if elevators or lifts are not available to connect different levels. However, some people who use walking aids have difficulty with ramps and prefer stairs.

**A4.8.2 Slope and Rise.** Ramp slopes between 1:16 and 1:20 are preferred. The ability to manage an incline is related to both its slope and its length. Wheelchair users with

disabilities affecting their arms or with low stamina have serious difficulty using inclines. Most ambulatory people and most people who use wheelchairs can manage a slope of 1:16. Many people cannot manage a slope of 1:12 for 30 ft (9 m).

**A4.8.4 Landings.** Level landings are essential toward maintaining an aggregate slope that complies with these guidelines. A ramp landing that is not level causes individuals using wheelchairs to tip backward or bottom out when the ramp is approached.

**A4.8.5 Handrails.** The requirements for stair and ramp handrails in this guideline are for adults. When children are principal users in a building or facility, a second set of handrails at an appropriate height can assist them and aid in preventing accidents.

**A4.9 Stairs.**

**A4.9.1 Minimum Number.** Only interior and exterior stairs connecting levels that are not connected by an elevator, ramp, or other accessible means of vertical access have to comply with 4.9.

**A4.10 Elevators.**

**A4.10.6 Door Protective and Reopening Device.** The required door reopening device would hold the door open for 20 seconds if the doorway remains obstructed. After 20 seconds, the door may begin to close. However, if designed in accordance with ASME A17.1-1990, the door closing movement could still be stopped if a person or object exerts sufficient force at any point on the door edge.

**A4.10.7 Door and Signal Timing for Hall Calls.** This paragraph allows variation in the location of call buttons, advance time for warning signals, and the door-holding period used to meet the time requirement.

**A4.10.12 Car Controls.** Industry-wide standardization of elevator control panel design would make all elevators significantly more convenient for use by people with severe visual impairments. In many cases, it will be possible to locate the highest control on elevator panels within 48 in (1220 mm) from the floor.



## A4.11 Platform Lifts (Wheelchair Lifts)

**A4.10.13 Car Position Indicators.** A special button may be provided that would activate the audible signal within the given elevator only for the desired trip, rather than maintaining the audible signal in constant operation.

**A4.10.14 Emergency Communications.** A device that requires no handset is easier to use by people who have difficulty reaching. Also, small handles on handset compartment doors are not usable by people who have difficulty grasping.

*Ideally, emergency two-way communication systems should provide both voice and visual display intercommunication so that persons with hearing impairments and persons with vision impairments can receive information regarding the status of a rescue. A voice intercommunication system cannot be the only means of communication because it is not accessible to people with speech and hearing impairments. While a voice intercommunication system is not required, at a minimum, the system should provide both an audio and visual indication that a rescue is on the way.*

## A4.11 Platform Lifts (Wheelchair Lifts).

**A4.11.2 Other Requirements.** Inclined stairway chairlifts, and inclined and vertical platform lifts (wheelchair lifts) are available for short-distance, vertical transportation of people with disabilities. Care should be taken in selecting lifts as some lifts are not equally suitable for use by both wheelchair users and semi ambulatory individuals.

## A4.12 Windows.

**A4.12.1 General.** Windows intended to be operated by occupants in accessible spaces should comply with 4.12.

**A4.12.2 Window Hardware.** Windows requiring pushing, pulling, or lifting to open (for example, double-hung, sliding, or casement and awning units without cranks) should require no more than 5 lbf (22.2 N) to open or close. Locks, cranks, and other window hardware should comply with 4.27.

## A4.13 Doors.

**A4.13.8 Thresholds at Doorways.** Thresholds and surface height changes in doorways are particularly inconvenient for wheelchair users who also have low stamina or restrictions in arm movement because complex maneuvering is required to get over the level change while operating the door.

**A4.13.9 Door Hardware.** Some disabled persons must push against a door with their chair or walker to open it. Applied kickplates on doors with closers can reduce required maintenance by withstanding abuse from wheelchairs and canes. To be effective, they should cover the door width, less approximately 2 in (51 mm), up to a height of 16 in (405 mm) from its bottom edge and be centered across the width of the door.

**A4.13.10 Door Closers.** Closers with delayed action features give a person more time to maneuver through doorways. They are particularly useful on frequently used interior doors such as entrances to toilet rooms.

**A4.13.11 Door Opening Force.** Although most people with disabilities can exert at least 5 lbf (22.2N), both pushing and pulling from a stationary position, a few people with severe disabilities cannot exert 3 lbf (13.13N). Although some people cannot manage the allowable forces in this guideline and many others have difficulty, door closers must have certain minimum closing forces to close doors satisfactorily. Forces for pushing or pulling doors open are measured with a push-pull scale under the following conditions:

(1) Hinged doors: Force applied perpendicular to the door at the door opener or 30 in (760 mm) from the hinged side, whichever is farther from the hinge.

(2) Sliding or folding doors: Force applied parallel to the door at the door pull or latch.

(3) Application of force: Apply force gradually so that the applied force does not exceed the resistance of the door. In high-rise buildings, air-pressure differentials may require a modification of this specification in order to meet the functional intent.

**A4.15 Drinking Fountains and Water Coolers****A4.13.12 Automatic Doors and Power-Assisted Doors.**

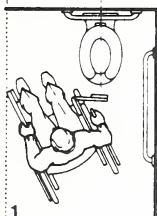
Sliding automatic doors do not need guard rails and are more convenient for wheelchair users and visually impaired people to use. If slowly opening automatic doors can be reactivated before their closing cycle is completed, they will be more convenient in busy doorways.

**A4.15 Drinking Fountains and Water Coolers.**

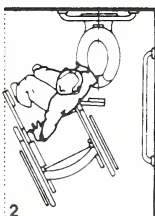
**A4.15.2 Spout Height.** *Two drinking fountains, mounted side by side or on a single post, are usable by people with disabilities and people who find it difficult to bend over.*

18-30  
455 - 760

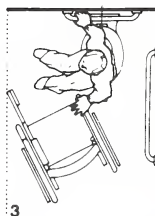
18  
455



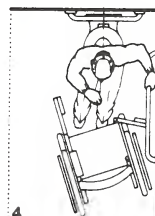
1  
Takes transfer position, swings footrest out of the way, sets brakes.



2  
Removes armrest, transfers.



3  
Moves wheelchair out of the way, changes position (some people fold chair or pivot it 90° to the toilet).

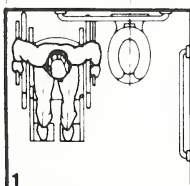


4  
Positions on toilet, releases brake.

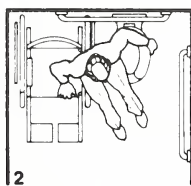
(a)  
Diagonal Approach

42  
1065

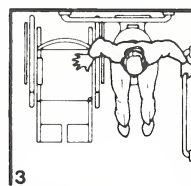
18  
455



1  
Takes transfer position, removes armrest, sets brakes.



2  
Transfers.



3  
Positions on toilet.

(b)  
Side Approach

Fig. A6  
Wheelchair Transfers

## A4.16 Water Closets

### A4.16 Water Closets.

**A4.16.3 Height.** Height preferences for toilet seats vary considerably among disabled people. Higher seat heights may be an advantage to some ambulatory disabled people, but are often a disadvantage for wheelchair users and others. Toilet seats 18 in (455 mm) high seem to be a reasonable compromise. Thick seats and filler rings are available to adapt standard fixtures to these requirements.

**A4.16.4 Grab Bars.** Fig. A6(a) and (b) show the diagonal and side approaches most commonly used to transfer from a wheelchair to a water closet. Some wheelchair users can transfer from the front of the toilet while others use a 90-degree approach. Most people who use the two additional approaches can also use either the diagonal approach or the side approach.

**A4.16.5 Flush Controls.** Flush valves and related plumbing can be located behind walls or to the side of the toilet, or a toilet seat lid can be provided if plumbing fittings are directly behind the toilet seat. Such designs reduce the chance of injury and imbalance caused by leaning back against the fittings. Flush controls for tank-type toilets have a standardized mounting location on the left side of the tank (facing the tank). Tanks can be obtained by special order with controls mounted on the right side. If administrative authorities require flush controls for flush valves to be located in a position that conflicts with the location of the rear grab bar, then that bar may be split or shifted toward the wide side of the toilet area.

### A4.17 Toilet Stalls.

**A4.17.3 Size and Arrangement.** This section requires use of the 60 in (1525 mm) standard stall (Figure 30(a)) and permits the 36 in (915 mm) or 48 in (1220 mm) wide alternate stall (Figure 30(b)) only in alterations where provision of the standard stall is technically infeasible or where local plumbing codes prohibit reduction in the number of fixtures. A standard stall provides a clear space on one side of the water closet to enable persons who use wheelchairs to perform a side or diagonal transfer from the wheelchair to the water closet. However, some persons with disabilities who use mobility aids such as walkers, canes or crutches

are better able to use the two parallel grab bars in the 36 in (915 mm) wide alternate stall to achieve a standing position.

In large toilet rooms, where six or more toilet stalls are provided, it is therefore required that a 36 in (915 mm) wide stall with parallel grab bars be provided in addition to the standard stall required in new construction. The 36 in (915 mm) width is necessary to achieve proper use of the grab bars; wider stalls would position the grab bars too far apart to be easily used and narrower stalls would position the grab bars too close to the water closet. Since the stall is primarily intended for use by persons using canes, crutches and walkers, rather than wheelchairs, the length of the stall could be conventional. The door, however, must swing outward to ensure a usable space for people who use crutches or walkers.

**A4.17.5 Doors.** To make it easier for wheelchair users to close toilet stall doors, doors can be provided with closers, spring hinges, or a pull bar mounted on the inside surface of the door near the hinge side.

### A4.19 Lavatories and Mirrors.

**A4.19.6 Mirrors.** If mirrors are to be used by both ambulatory people and wheelchair users, then they must be at least 74 in (1880 mm) high at their topmost edge. A single full length mirror can accommodate all people, including children.

### A4.21 Shower Stalls.

**A4.21.1 General.** Shower stalls that are 36 in by 36 in (915 mm by 915 mm) wide provide additional safety to people who have difficulty maintaining balance because all grab bars and walls are within easy reach. Seated people use the walls of 36 in by 36 in (915 mm by 915 mm) showers for back support. Shower stalls that are 60 in (1525 mm) wide and have no curb may increase usability of a bathroom by wheelchair users because the shower area provides additional maneuvering space.

### A4.22 Toilet Rooms.

**A4.22.3 Clear Floor Space.** In many small facilities, single-user restrooms may be the only

**A4.22 Toilet Rooms**

facilities provided for all building users. In addition, the guidelines allow the use of "unisex" or "family" accessible toilet rooms in alterations when technical infeasibility can be demonstrated. Experience has shown that the provision of accessible "unisex" or single-user restrooms is a reasonable way to provide access for wheelchair users and any attendants, especially when attendants are of the opposite sex. Since these facilities have proven so useful, it is often considered advantageous to install a "unisex" toilet room in new facilities in addition to making the multi-stall restrooms accessible, especially in shopping malls, large auditoriums, and convention centers.

Figure 28 (section 4.16) provides minimum clear floor space dimensions for toilets in accessible "unisex" toilet rooms. The dotted lines designate the minimum clear floor space, depending on the direction of approach, required for wheelchair users to transfer onto the water closet. The dimensions of 48 in (1220 mm) and 60 in (1525 mm), respectively, correspond to the space required for the two common transfer approaches utilized by wheelchair users (see Fig. A6). It is important to keep in mind that the placement of the lavatory to the immediate side of the water closet will preclude the side approach transfer illustrated in Figure A6(b).

To accommodate the side transfer, the space adjacent to the water closet must remain clear of obstruction for 42 in (1065 mm) from the centerline of the toilet (Figure 28) and the lavatory must not be located within this clear space. A turning circle or T-turn, the clear floor space at the lavatory, and maneuvering space at the door must be considered when determining the possible wall locations. A privacy latch or other accessible means of ensuring privacy during use should be provided at the door.

**RECOMMENDATIONS:**

1. In new construction, accessible single-user restrooms may be desirable in some situations because they can accommodate a wide variety of building users. However, they cannot be used in lieu of making the multi-stall toilet rooms accessible as required.
2. Where strict compliance to the guidelines for accessible toilet facilities is technically infeasible in the alteration of existing facilities, accessible "unisex" toilets are a reasonable alternative.
3. In designing accessible single-user restrooms, the provisions of adequate space to allow a side transfer will provide accommodation to the largest number of wheelchair users.

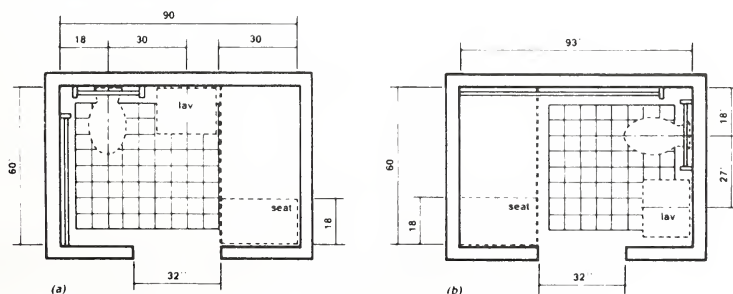


Fig. A7



**A4.23 Bathrooms, Bathing Facilities, and Shower Rooms****A4.23 Bathrooms, Bathing Facilities, and Shower Rooms.**

**A4.23.3 Clear Floor Space.** Figure A7 shows two possible configurations of a toilet room with a roll-in shower. The specific shower shown is designed to fit exactly within the dimensions of a standard bathtub. Since the shower does not have a lip, the floor space can be used for required maneuvering space. This would permit a toilet room to be smaller than would be permitted with a bathtub and still provide enough floor space to be considered accessible. This design can provide accessibility in facilities where space is at a premium (i.e., hotels and medical care facilities). The alternate roll-in shower (Fig. 57b) also provides sufficient room for the "T-turn" and does not require plumbing to be on more than one wall.

**A4.23.9 Medicine Cabinets.** Other alternatives for storing medical and personal care items are very useful to disabled people. Shelves, drawers, and floor-mounted cabinets can be provided within the reach ranges of disabled people.

**A4.26 Handrails, Grab Bars, and Tub and Shower Seats.**

**A4.26.1 General.** Many disabled people rely heavily upon grab bars and handrails to maintain balance and prevent serious falls. Many people brace their forearms between supports and walls to give them more leverage and stability in maintaining balance or for lifting. The grab bar clearance of 1-1/2 in (38 mm) required in this guideline is a safety clearance to prevent injuries resulting from arms slipping through the openings. It also provides adequate gripping room.

**A4.26.2 Size and Spacing of Grab Bars and Handrails.** This specification allows for alternate shapes of handrails as long as they allow an opposing grip similar to that provided by a circular section of 1-1/4 in to 1-1/2 in (32 mm to 38 mm).

**A4.27 Controls and Operating Mechanisms.**

**A4.27.3 Height.** Fig. A8 further illustrates

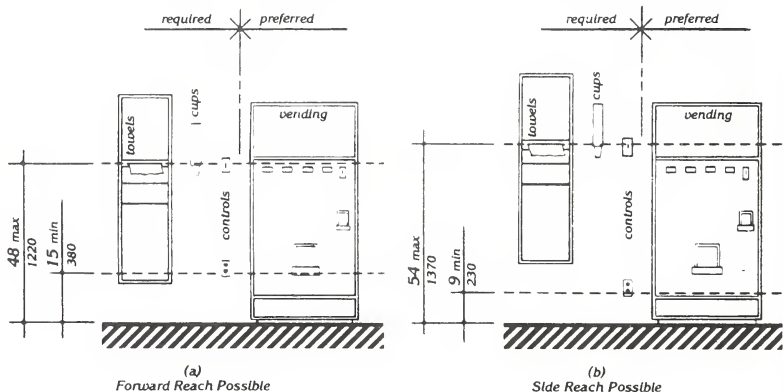


Fig. A8  
Control Reach Limitations

## A4.28 Alarms

mandatory and advisory control mounting height provisions for typical equipment.

Electrical receptacles installed to serve individual appliances and not intended for regular or frequent use by building occupants are not required to be mounted within the specified reach ranges. Examples would be receptacles installed specifically for wall-mounted clocks, refrigerators, and microwave ovens.

## A4.28 Alarms.

**A4.28.2 Audible Alarms.** Audible emergency signals must have an intensity and frequency that can attract the attention of individuals who have partial hearing loss. People over 60 years of age generally have difficulty perceiving frequencies higher than 10,000 Hz. An alarm signal which has a periodic element to its signal, such as single stroke bells (clang-pause-clang-pause), hi-low (up-down-up-down) and fast whoop (on-off-on-off) are best. Avoid continuous or reverberating tones. Select a signal which has a sound characterized by three or four clear tones without a great deal of "noise" in between.

**A4.28.3 Visual Alarms.** The specifications in this section do not preclude the use of zoned or coded alarm systems.

**A4.28.4 Auxiliary Alarms.** Locating visual emergency alarms in rooms where persons who are deaf may work or reside alone can ensure that they will always be warned when an emergency alarm is activated. To be effective, such devices must be located and oriented so that they will spread signals and reflections throughout a space or raise the overall light level sharply. However, visual alarms alone are not necessarily the best means to alert sleepers. A study conducted by Underwriters Laboratory (UL) concluded that a flashing light more than seven times brighter was required (110 candela v. 15 candela, at the same distance) to awaken sleepers as was needed to alert awake subjects in a normal daytime illuminated room.

For hotel and other rooms where people are likely to be asleep, a signal-activated vibrator placed between mattress and box spring or under a pillow was found by UL to be much more effective in alerting sleepers. Many readily available devices are sound-activated so that they could respond to an alarm clock, clock

radio, wake-up telephone call or room smoke detector. Activation by a building alarm system can either be accomplished by a separate circuit activating an auditory alarm which would, in turn, trigger the vibrator or by a signal transmitted through the ordinary 110-volt outlet. Transmission of signals through the power line is relatively simple and is the basis of common, inexpensive remote light control systems sold in many department and electronic stores for home use. So-called "wireless" intercoms operate on the same principal.

## A4.29 Detectable Warnings.

**A4.29.2 Detectable Warnings on Walking Surfaces.** The material used to provide contrast should contrast by at least 70%. Contrast in percent is determined by:

$$\text{Contrast} = [(B_1 - B_2)/B_2] \times 100$$

where  $B_1$  = light reflectance value (LRV) of the lighter area  
and  $B_2$  = light reflectance value (LRV) of the darker area.

Note that in any application both white and black are never absolute; thus,  $B_1$  never equals 100 and  $B_2$  is always greater than 0.

## A4.30 Signage.

**A4.30.1 General.** In building complexes where finding locations independently on a routine basis may be a necessity (for example, college campuses), tactile maps or prerecorded instructions can be very helpful to visually impaired people. Several maps and auditory instructions have been developed and tested for specific applications. The type of map or instructions used must be based on the information to be communicated, which depends highly on the type of buildings or users.

Landmarks that can easily be distinguished by visually impaired individuals are useful as orientation cues. Such cues include changes in illumination level, bright colors, unique patterns, wall murals, location of special equipment or other architectural features.

Many people with disabilities have limitations in movement of their heads and reduced peripheral vision. Thus, signage positioned

## A4.30 Signage

perpendicular to the path of travel is easiest for them to notice. People can generally distinguish signage within an angle of 30 degrees to either side of the centerlines of their faces without moving their heads.

**A4.30.2 Character Proportion.** The legibility of printed characters is a function of the viewing distance, character height, the ratio of the stroke width to the height of the character, the contrast of color between character and background, and print font. The size of characters must be based upon the intended viewing distance. A severely nearsighted person may have to be much closer to recognize a character of a given size than a person with normal visual acuity.

**A4.30.4 Raised and Brailled Characters and Pictorial Symbol Signs (Pictograms).** The standard dimensions for literary Braille are as follows:

Dot diameter	.059 in.
Inter-dot spacing	.090 in.
Horizontal separation between cells	.241 in.
Vertical separation between cells	.395 in.

Raised borders around signs containing raised characters may make them confusing to read unless the border is set far away from the characters. Accessible signage with descriptive materials about public buildings, monuments, and objects of cultural interest may not provide sufficiently detailed and meaningful information. Interpretive guides, audio tape devices, or other methods may be more effective in presenting such information.

**A4.30.5 Finish and Contrast.** An eggshell finish (11 to 19 degree gloss on 60 degree glossimeter) is recommended. Research indicates that signs are more legible for persons with low vision when characters contrast with their background by at least 70 percent. Contrast in percent shall be determined by:

$$\text{Contrast} = [(B_1 - B_2) / B_1] \times 100$$

where  $B_1$  = light reflectance value (LRV) of the lighter area  
and  $B_2$  = light reflectance value (LRV) of the darker area.

Note that in any application both white and black are never absolute; thus,  $B_1$  never equals 100 and  $B_2$  is always greater than 0.

The greatest readability is usually achieved through the use of light-colored characters or symbols on a dark background.

### A4.30.7 Symbols of Accessibility for Different Types of Listening Systems.

Paragraph 4 of this section requires signage indicating the availability of an assistive listening system. An appropriate message should be displayed with the international symbol of access for hearing loss since this symbol conveys general accessibility for people with hearing loss. Some suggestions are:

INFRARED  
ASSISTIVE LISTENING SYSTEM  
AVAILABLE  
—PLEASE ASK—

AUDIO LOOP IN USE  
TURN T-SWITCH FOR  
BETTER HEARING  
—OR ASK FOR HELP—

FM  
ASSISTIVE LISTENING  
SYSTEM AVAILABLE  
—PLEASE ASK—

The symbol may be used to notify persons of the availability of other auxiliary aids and services such as: real time captioning, captioned note taking, sign language interpreters, and oral interpreters.

**A4.30.8 Illumination Levels.** Illumination levels on the sign surface shall be in the 100 to 300 lux range (10 to 30 footcandles) and shall be uniform over the sign surface. Signs shall be located such that the illumination level on the surface of the sign is not significantly exceeded by the ambient light or visible bright lighting source behind or in front of the sign.

## A4.31 Telephones

## A4.31 Telephones.

**A4.31.3 Mounting Height.** In localities where the dial-tone first system is in operation, calls can be placed at a coin telephone through the operator without inserting coins. The operator button is located at a height of 46 in (1170 mm) if the coin slot of the telephone is at 54 in (1370 mm). A generally available public telephone with a coin slot mounted lower on the equipment would allow universal installation of telephones at a height of 48 in (1220 mm) or less to all operable parts.

**A4.31.9 Text Telephones.** A public text telephone may be an integrated text telephone pay phone unit or a conventional portable text telephone that is permanently affixed within, or adjacent to, the telephone enclosure. In order to be usable with a pay phone, a text telephone which is not a single integrated text telephone pay phone unit will require a shelf large enough (10 in (255mm) wide by 10 in (255 mm) deep with a 6 in (150 mm) vertical clearance minimum) to accommodate the device, an electrical outlet, and a power cord. Movable or portable text telephones may be used to provide equivalent facilitation. A text telephone should be readily available so that a person using it may access the text telephone easily and conveniently. As currently designed pocket-type text telephones for personal use do not accommodate a wide range of users. Such devices would not be considered substantially equivalent to conventional text telephones. However, in the future as technology develops this could change.

## A4.32 Fixed or Built-in Seating and Tables.

## A4.32.4 Height of Tables or Counters.

Different types of work require different table or counter heights for comfort and optimal performance. Light detailed work such as writing requires a table or counter close to elbow height for a standing person. Heavy manual work such as rolling dough requires a counter or table height about 10 in (255 mm) below elbow height for a standing person. This principle of high/low table or counter heights also applies for seated persons; however, the limiting condition for seated manual work is clearance under the table or counter.

Table A1 shows convenient counter heights for seated persons. The great variety of heights for comfort and optimal performance indicates a need for alternatives or a compromise in height if people who stand and people who sit will be using the same counter area.

**Table A1**  
**Convenient Heights of Tables**  
**and Counters for Seated People<sup>1</sup>**

Conditions of Use	Short Women in mm	Tall Men in mm
Seated in a wheelchair:		
Manual work—		
Desk or removeable armrests	26 660	30 760
Fixed, full-size armrests <sup>2</sup>	32 <sup>3</sup> 815	32 <sup>3</sup> 815
Light detailed work:		
Desk or removeable armrests	29 735	34 865
Fixed, full-size armrests <sup>2</sup>	32 <sup>3</sup> 815	34 865
Seated in a 16-in. (405-mm)		
High chair:		
Manual work	26 660	27 685
Light detailed work	28 710	31 785

<sup>1</sup> All dimensions are based on a work-surface thickness of 1 1/2 in (38 mm) and a clearance of 1 1/2 in (38 mm) between legs and the underside of a work surface.

<sup>2</sup> This type of wheelchair arm does not interfere with the positioning of a wheelchair under a work surface.

<sup>3</sup> This dimension is limited by the height of the armrests: a lower height would be preferable. Some people in this group prefer lower work surfaces, which require positioning the wheelchair back from the edge of the counter.

## A4.33 Assembly Areas.

## A4.33.2 Size of Wheelchair Locations.

Spaces large enough for two wheelchairs allow people who are coming to a performance together to sit together.

## A4.33.3 Placement of Wheelchair

**Locations.** The location of wheelchair areas can be planned so that a variety of positions

**Table A2. Summary of Assistive Listening Devices**

within the seating area are provided. This will allow choice in viewing and price categories.

*Building/life safety codes set minimum distances between rows of fixed seats with consideration of the number of seats in a row, the exit aisle width and arrangement, and the location of exit doors. "Continental" seating, with a greater number of seats per row and a*

*commensurate increase in row spacing and exit doors, facilitates emergency egress for all people and increases ease of access to mid-row seats especially for people who walk with difficulty. Consideration of this positive attribute of "continental" seating should be included along with all other factors in the design of fixed seating areas.*

**Table A2. Summary of Assistive Listening Devices**

System	Advantages	Disadvantages	Typical Applications
<p>Induction Loop</p> <p>Transmitter: Transducer wired to induction loop around listening area.</p> <p>Receiver: Self-contained induction receiver or personal hearing aid with telecoil.</p>	<p>Cost-Effective</p> <p>Low Maintenance</p> <p>Easy to use</p> <p>Unobtrusive</p> <p>May be possible to integrate into existing public address system.</p> <p>Some hearing aids can function as receivers.</p>	<p>Signal spills over to adjacent rooms.</p> <p>Susceptible to electrical interference.</p> <p>Limited portability</p> <p>Inconsistent signal strength.</p> <p>Head position affects signal strength.</p> <p>Lack of standards for induction coil performance.</p>	<p>Meeting areas</p> <p>Theaters</p> <p>Churches and Temples</p> <p>Conference rooms</p> <p>Classrooms</p> <p>TV viewing</p>
<p>FM</p> <p>Transmitter: Flashlight-sized worn by speaker.</p> <p>Receiver: With personal hearing aid via DAI or induction neck-loop and telecoil; or self-contained with earphone(s).</p>	<p>Highly portable</p> <p>Different channels allow use by different groups within the same room.</p> <p>High user mobility</p> <p>Variable for large range of hearing losses.</p>	<p>High cost of receivers</p> <p>Equipment fragile</p> <p>Equipment obtrusive</p> <p>High maintenance</p> <p>Expensive to maintain</p> <p>Custom fitting to individual user may be required.</p>	<p>Classrooms</p> <p>Tour groups</p> <p>Meeting areas</p> <p>Outdoor events</p> <p>One-on-one</p>
<p>Infrared</p> <p>Transmitter: Emitter in line-of-sight with receiver.</p> <p>Receiver: Self-contained. Or with personal hearing aid via DAI or induction neckloop and telecoil.</p>	<p>Easy to use</p> <p>Insures privacy or confidentiality</p> <p>Moderate cost</p> <p>Can often be integrated into existing public address system.</p>	<p>Line-of-sight required between emitter and receiver.</p> <p>Ineffective outdoors</p> <p>Limited portability</p> <p>Requires installation</p>	<p>Theaters</p> <p>Churches and Temples</p> <p>Auditoriums</p> <p>Meetings requiring confidentiality</p> <p>TV viewing</p>

Source: Rehab Brief, National Institute on Disability and Rehabilitation Research, Washington, DC, Vol. XII, No. 10, (1990).



**A5.0 Restaurants and Cafeterias****A4.33.6 Placement of Listening**

**Systems.** A distance of 50 ft (15 m) allows a person to distinguish performers' facial expressions.

**A4.33.7 Types of Listening Systems.**

An assistive listening system appropriate for an assembly area for a group of persons or where the specific individuals are not known in advance, such as a playhouse, lecture hall or movie theater, may be different from the system appropriate for a particular individual provided as an auxiliary aid or as part of a reasonable accommodation. The appropriate device for an individual is the type that individual can use, whereas the appropriate system for an assembly area will necessarily be geared toward the "average" or aggregate needs of various individuals. A listening system that can be used from any seat in a seating area is the most flexible way to meet this specification. Earphone jacks with variable volume controls can benefit only people who have slight hearing loss and do not help people who use hearing aids. At the present time, magnetic induction loops are the most feasible type of listening system for people who use hearing aids equipped with "T-coils," but people without hearing aids or those with hearing aids not equipped with inductive pick-ups cannot use them without special receivers. Radio frequency systems can be extremely effective and inexpensive. People without hearing aids can use them, but people with hearing aids need a special receiver to use them as they are presently designed. If hearing aids had a jack to allow a by-pass of microphones, then radio frequency systems would be suitable for people with and without hearing aids. Some listening systems may be subject to interference from other equipment and feedback from hearing aids of people who are using the systems. Such interference can be controlled by careful engineering design that anticipates feedback sources in the surrounding area.

Table A2, reprinted from a National Institute of Disability and Rehabilitation Research "Rehab Brief," shows some of the advantages and disadvantages of different types of assistive listening systems. In addition, the Architectural and Transportation Barriers Compliance Board (Access Board) has published a pamphlet on Assistive Listening Systems which lists demonstration centers across the country where technical assistance can be obtained in selecting and installing appropriate systems. The state of

New York has also adopted a detailed technical specification which may be useful.

**A5.0 Restaurants and Cafeterias.**

**A5.1 General.** Dining counters (where there is no service) are typically found in small carry-out restaurants, bakeries, or coffee shops and may only be a narrow eating surface attached to a wall. This section requires that where such a dining counter is provided, a portion of the counter shall be at the required accessible height.

**A7.0 Business and Mercantile.**

**A7.2(3) Assistive Listening Devices.** At all sales and service counters, teller windows, box offices, and information kiosks where a physical barrier separates service personnel and customers, it is recommended that at least one permanently installed assistive listening device complying with 4.33 be provided at each location or series. Where assistive listening devices are installed, signage should be provided identifying those stations which are so equipped.

**A7.3 Check-out Aisles.** Section 7.2 refers to counters without aisles; section 7.3 concerns check-out aisles. A counter without an aisle (7.2) can be approached from more than one direction such as in a convenience store. In order to use a check-out aisle (7.3), customers must enter a defined area (an aisle) at a particular point, pay for goods, and exit at a particular point.

**A10.3 Fixed Facilities and Stations.**

**A10.3.1(7) Route Signs.** One means of making control buttons on fare vending machines usable by persons with vision impairments is to raise them above the surrounding surface. Those activated by a mechanical motion are likely to be more detectable. If farecard vending, collection, and adjustment devices are designed to accommodate farecards having one tactually distinctive corner, then a person who has a vision impairment will insert the card with greater ease. Token collection devices that are designed to accommodate tokens which are perforated can allow a person to distinguish more readily between tokens and common coins. Thoughtful placement of accessible gates and fare vending machines in relation to inaccessible devices will make their use and detection easier for all persons with disabilities.

**Appendix B to Part 37—UMTA Regional Offices**

- Region I, Urban Mass Transportation Administration, 206 Federal Plaza, Suite 2940, New York, NY 10278
- Region II, Urban Mass Transportation Administration, Transportation Systems Center, Kendall Square, 55 Broadway, Suite 921, Cambridge, MA 02142
- Region III, Urban Mass Transportation Administration, 841 Chestnut Street, Suite 714, Philadelphia, PA 19107
- Region IV, Urban Mass Transportation Administration, 1720 Peachtree Road NW., Suite 400, Atlanta, GA 30309
- Region V, Urban Mass Transportation Administration, 55 East Monroe Street, Room 1415, Chicago, IL 60603
- Region VI, Urban Mass Transportation Administration, 819 Taylor Street, Suite 9A32, Ft. Worth, TX 76102
- Region VII, Urban Mass Transportation Administration, 6301 Rockville Road, Suite 303, Kansas City, MS 64131
- Region VIII, Urban Mass Transportation Administration, Federal Office Building, 1961 Stout Street, 5th Floor, Denver, CO 80294
- Region IX, Urban Mass Transportation Administration, 211 Main Street, Room 1160, San Francisco, CA 94105
- Region X, Urban Mass Transportation Administration, 3142 Federal Building, 915 Second Avenue, Seattle, WA 98174

**Appendix C to Part 37—Certifications***Certification of Equivalent Service*

The (name of agency) certifies that its demand responsive service offered to individuals with disabilities, including individuals who use wheelchairs, is equivalent to the level and quality of service offered to individuals without disabilities. Such service, when viewed in its entirety, is provided in the most integrated setting feasible and is equivalent with respect to:

- (1) Response time;
- (2) Fares;
- (3) Geographic service area;
- (4) Hours and days of service;
- (5) Restrictions on trip purpose;
- (6) Availability of information and reservation capability; and
- (7) Constraints on capacity or service availability.

In accordance with 49 CFR 37.77, public entities operating demand responsive systems for the general public which receive financial assistance under section 18 of the Urban Mass Transportation Act must file this certification with the appropriate state program office before procuring any inaccessible vehicle. Such public entities not receiving UMTA funds shall also file the certification with the appropriate state program office. Such public entities receiving UMTA funds under any other section of the UMTA Act must file the certification with the appropriate UMTA regional office. This certification is valid for no longer than one year from its date of filing.

(name of authorized official)

(title)

(signature)

*MPO Certification of Paratransit Plan*

The (name of Metropolitan Planning Organization) hereby certifies that it has reviewed the ADA paratransit plan prepared by (name of submitting entity (ies)) as required under 49 CFR part 37.139(h) and finds it to be in conformance with the transportation plan developed under 49 CFR part 613 and 23 CFR part 450 (the UMTA/FHWA joint planning regulation). This certification is valid for one year.

(signature)

(name of authorized official)

(title)

(date)

*Existing Paratransit Service Survey*

This is to certify that (name of public entity (ies)) has conducted a survey of existing paratransit services as required by 49 CFR 37.137 (a).

(signature)

(name of authorized official)

(title)

(date)

*Included Service Certification*

This is to certify that service provided by other entities but included in the ADA paratransit plan submitted by (name of submitting entity (ies)) meets the requirements of 49 CFR part 37, subpart F providing that ADA eligible individuals have access to the service; the service is provided in the manner represented; and, that efforts will be made to coordinate the provision of paratransit service offered by other providers.

(signature)

(name of authorized official)

(title)

(date)

*Joint Plan Certification I*

This is to certify that (name of entity covered by joint plan) is committed to providing ADA paratransit service as part of this coordinated plan and in conformance with the requirements of 49 CFR part 37, subpart F.

(signature)

(name of authorized official)

(title)

(date)

*Joint Plan Certification II*

This is to certify that (name of entity covered by joint plan) will, in accordance with 49 CFR 37.141, maintain current levels of paratransit service until the coordinated plan goes into effect.

(signature)

(name of authorized official)

(title)

(date)

*State Certification that Plans have been Received*

This is to certify that all ADA paratransit plans required under 49 CFR 37.139 have been received by (state DOT)

(signature)

(name of authorized official)

(title)

(date)

**Appendix D to Part 37—Construction and Interpretation of Provisions of 49 CFR part 37**

This appendix explains the Department's construction and interpretation of provisions of 49 CFR part 37. It is intended to be used as definitive guidance concerning the meaning and implementation of these provisions. The Appendix is organized on a section-by-section basis. Some sections of the rule are not discussed in the Appendix, because they are self-explanatory or we do not currently have interpretive material to provide concerning them.

The Department also provides guidance by other means, such as manuals and letters. The Department intends to update this Appendix periodically to include guidance, provided in response to inquiries about specific situations, that is of general relevance or interest.

**Amendments to 49 CFR Part 27**

Section 27.67(d) has been revised to reference the Access Board facility guidelines (found in appendix A to part 37) as well as the Uniform Federal Accessibility Standard (UFAS). This change was made to ensure consistency between requirements under section 504 and the ADA. Several caveats relating to the application of UFAS (e.g., that spaces not used by the public or likely to result in the employment of individuals with disabilities would not have to meet the standards) have been deleted. It is the Department's understanding that provisions of the Access Board standards and part 37 make them unnecessary.

The Department is aware that there is a transition period between the publication of this rule and the effective date of many of its provisions (e.g., concerning facilities and paratransit services) during which section 504 remains the basic authority for accessibility

modifications. In this interval, the Department expects recipients' compliance with section 504 to look forward to compliance with the ADA provisions. That is, if a recipient is making a decision about the shape of its paratransit service between the publication of this rule and January 26, 1992, the decision should be in the direction of service that will help to comply with post-January 1992 requirements. A recipient that severely curtailed its present paratransit service in October, and then asked for a three- or five-year phase-in of service under its paratransit plan, would not be acting consistent with this policy.

Likewise, the Department would view with disfavor any attempt by a recipient to accelerate the beginning of the construction, installation or alteration of a facility to before January 26, 1992, to "beat the clock" and avoid the application of this rule's facility standards. The Department would be very reluctant to approve grants, contracts, exemption requests etc., that appear to have this effect. The purpose of the Department's administration of section 504 is to ensure compliance with the national policy stated in the ADA, not to permit avoidance of it.

#### Subpart A—General

##### Section 37.3 Definitions

The definition of "commuter authority" includes a list of commuter rail operators drawn from a statutory reference in the ADA. It should be noted that this list is not exhaustive. Other commuter rail operators (e.g., in Chicago or San Francisco) would also be encompassed by this definition.

The definition of "commuter bus service" is important because the ADA does not require complementary paratransit to be provided with respect to commuter bus service operated by public entities. The rationale that may be inferred for the statutory exemption for this kind of service concerns its typical characteristics (e.g., no attempt to comprehensively cover a service area, limited route structure, limited origins and destinations, interface with another mode of transportation, limited purposes of travel). These characteristics can be found in some transportation systems other than bus systems oriented toward work trips. For example, bus service that is used as a dedicated connector to commuter or intercity rail service, certain airport shuttles, and university bus systems share many or all of these characteristics. As explained further in the discussion of subpart B, the Department has determined that it is appropriate to cover these services with the requirements applicable to commuter bus systems.

The definitions of "designated public transportation" and "specified public transportation" exclude transportation by aircraft. Persons interested in matters concerning access to air travel for individuals with disabilities should refer to 14 CFR part 382, the Department's regulation implementing the Air Carrier Access Act. Since the facility requirements of this part refer to facilities involved in the provision of designated or specified public transportation, airport facilities are not covered by this part. DOJ makes clear that public and private airport facilities are covered under its title II and title III regulations, respectively.

The examples given in the definition of "facility" all relate to ground transportation. We would point out that, since transportation by passenger vessels is covered by this rule and by DOJ rules, such vessel-related facilities as docks, wharfs, vessel terminals etc. fall under this definition. It is intended that specific requirements for vessels and related facilities will be set forth in future rulemaking.

The definitions of "fixed route system" and "demand responsive system" derive directly from the ADA's definitions of these terms. Some systems, like a typical city bus system or a dial-a-ride van system, fit clearly into one category or the other. Other systems may not so clearly fall into one of the categories. Nevertheless, because how a system is categorized has consequences for the requirements it must meet, entities must determine, on a case-by-case basis, into which category their systems fall.

In making this determination, one of the key factors to be considered is whether the individual, in order to use the service, must request the service, typically by making a call.

With fixed route service, no action by the individual is needed to initiate public transportation. If an individual is at a bus stop at the time the bus is scheduled to appear, then that individual will be able to access the transportation system. With demand-responsive service, an additional step must be taken by the individual before he or she can ride the bus, i.e., the individual must make a telephone call. (S. Rept. 101-116 at 54).

Other factors, such as the presence or absence of published schedules, or the variation of vehicle intervals in anticipation of differences in usage, are less important in making the distinction between the two types of service. If a service is provided along a given route, and a vehicle will arrive at certain times regardless of whether a passenger actively requests the vehicle, the service in most cases should be regarded as fixed route rather than demand responsive.

At the same time, the fact that there is an interaction between a passenger and transportation service does not necessarily make the service demand responsive. For many types of service (e.g., intercity bus, intercity rail) which are clearly fixed route, a passenger has to interact with an agent to buy a ticket. Some services (e.g., certain commuter bus or commuter rail operations) may use flag stops, in which a vehicle along the route does not stop unless a passenger flags the vehicle down. A traveler staying at a hotel usually makes a room reservation before hopping on the hotel shuttle. This kind of interaction does not make an otherwise fixed route service demand responsive.

On the other hand, we would regard a system that permits user-initiated deviations from routes or schedules as demand-responsive. For example, if a rural public transit system (e.g., a section 18 recipient) has a few fixed routes, the fixed route portion of its system would be subject to the requirements of subpart F for complementary paratransit service. If the entity changed its system so that it operated as a route-deviation system, we would regard it as a

demand responsive system. Such a system would not be subject to complementary paratransit requirements.

The definition of "individual with a disability" excludes someone who is currently engaging in the illegal use of drugs, when a covered entity is acting on the basis of such use. This concept is more important in employment and public accommodations contexts than it is in transportation, and is discussed at greater length in the DOJ and EEOC rules. Essentially, the definition says that, although drug addiction (i.e., the status or a diagnosis of being a drug abuser) is a disability, no one is regarded as being an individual with a disability on the basis of current illegal drug use.

Moreover, even if an individual has a disability, a covered entity can take action against the individual if that individual is currently engaging in illegal drug use. For example, if a person with a mobility or vision impairment is ADA paratransit eligible, but is caught possessing or using cocaine or marijuana on a paratransit vehicle, the transit provider can deny the individual further eligibility. If the individual has successfully undergone rehabilitation or is no longer using drugs, as explained in the preamble to the DOJ rules, the transit provider could not continue to deny eligibility on the basis that the individual was a former drug user or still was diagnosed as a person with a substance abuse problem.

We defined "paratransit" in order to note its specialized usage in the rule. Part 37 uses this term to refer to the complementary paratransit service comparable to public fixed route systems which must be provided. Typically, paratransit is provided in a demand responsive mode. Obviously, the rule refers to a wide variety of demand responsive services that are not "paratransit," in this specialized sense.

The ADA's definition of "over-the-road bus" may also be somewhat narrower than the common understanding of the term. The ADA definition focuses on a bus with an elevated passenger deck over a baggage compartment (i.e., a "Greyhound-type" bus). Other types of buses commonly referred to as "over-the-road buses," which are sometimes used for commuter bus or other service, do not come within this definition. Only buses that do come within the definition are subject to the over-the-road bus exception to accessibility requirements in Title III of the ADA.

For terminological clarity, we want to point out that two different words are used in ADA regulations to refer to devices on which individuals with hearing impairments communicate over telephone lines. DOJ uses the more traditional term "telecommunications device for the deaf" (TDD). The Access Board uses a newer term, "text telephone." The DOT rule uses the terms interchangeably.

The definition of "transit facility" applies only with reference to the TDD requirement of Appendix A to this Part. The point of the definition is to exempt from TDD requirements open structures, like bus shelters, or facilities which are not used primarily as transportation stops or



terminals. For example, a drug store in a small town may sell intercity bus tickets, and people waiting for the bus may even wait for the bus inside the store. But the drug store's *raison d'être* is not to be a bus station. Its transportation function is only incidental. Consequently, its obligations with respect to TDDs would be those required of a place of public accommodation by DOJ rules.

A "used vehicle" means a vehicle which has prior use; prior, that is, to its acquisition by its present owner or lessee. The definition is not relevant to existing vehicles in one's own fleet, which were obtained before the ADA vehicle accessibility requirements took effect.

A "vanpool" is a voluntary commuter ridesharing arrangement using a van with a seating capacity of more than seven persons, including the driver. Carpools are not included in the definition. There are some systems using larger vehicles (e.g., buses) that operate, in effect, as vanpools. This definition encompasses such systems. Vanpools are used for daily work trips, between commuters' homes (or collection points near them) and work sites (or drop points near them). Drivers are themselves commuters who are either volunteers who receive no compensation for their efforts or persons who are reimbursed by their riders for the vehicle, operating, and driving costs.

The definition of "wheelchair" includes a wide variety of mobility devices. This inclusiveness is consistent with the legislative history of the ADA (See S. Rept. 101-116 at 48). While some mobility devices may not look like many persons' traditional idea of a wheel chair, three and four wheeled devices, of many varied designs, are used by individuals with disabilities and must be transported. The definition of "common wheelchair," developed by the Access Board, is intended to help transit providers determine which wheelchairs they have to carry. The definition involves an "envelope" relating to the Access Board requirements for vehicle lifts.

A lift conforming to Access Board requirements is 30" x 48" and capable of lifting a wheelchair/occupant combination of up to 600 pounds. Consequently, a common wheelchair is one that fits these size and weight dimensions. Devices used by individuals with disabilities that do not fit this envelope (e.g., may "gurneys") do not have to be carried.

#### Section 37.5 Nondiscrimination

This section states the general nondiscrimination obligation for entities providing transportation service. It should be noted that virtually all public and private entities covered by this regulation are also covered by DOJ regulations, which have more detailed statements of general nondiscrimination obligations.

Under the ADA, an entity may not consign an individual with disabilities to a separate, "segregated," service for such persons, if the individual can in fact use the service for the general public. This is true even if the individual takes longer, or has more difficulty, than other persons in using the service for the general public.

One instance in which this principal applies concerns the use of designated

priority seats (e.g., the so-called "elderly and handicapped" seats near the entrances to buses). A person with a disability (e.g., a visual impairment) may choose to take advantage of this accommodation or not. If not, it is contrary to rule for the entity to insist that the individual must sit in the priority seats.

The prohibition on special charges applies to charges for service to individuals with disabilities that are higher than charges for the same or comparable services to other persons. For examples, if a shuttle service charges \$20.00 for a ride from a given location to the airport for most people, it could not charge \$40.00 because the passenger had a disability or needed to use the shuttle service's lift-equipped van. Higher mileage charges for using an accessible vehicle would likewise be inconsistent with the rule. So would charging extra to carry a service animal accompanying an individual with a disability.

If a taxi company charges \$1.00 to stow luggage in the trunk, it cannot charge \$2.00 to stow a folding wheelchair there. This provision does not mean, however, that a transportation provider cannot charge nondiscriminatory fees to passengers with disabilities. The taxi company in the above example can charge a passenger \$1.00 to stow a wheelchair in the trunk; it is not required to waive the charge. This section does not prohibit the fares for paratransit service which transit providers are allowed to charge under § 37.131(d).

A requirement for an attendant is inconsistent with the general nondiscrimination principle that prohibits policies that unnecessarily impose requirements on individuals with disabilities that are not imposed on others. Consequently, such requirements are prohibited. An entity is not required to provide attendant services (e.g., assistance in toileting, feeding, dressing) etc.

This provision must also be considered in light of the fact that an entity may refuse service to someone who engages in violent, seriously disruptive, or illegal conduct. If an entity may legitimately refuse service to someone, it may condition service to him on actions that would mitigate the problem. The entity could require an attendant as a condition of providing service if otherwise had the right to refuse.

The rule also points out that involuntary conduct related to a disability that may offend or annoy other persons, but which does not pose a direct threat, is not a basis for refusal of transportation. For example, some persons with Tourette's syndrome may make involuntary profane exclamations. These may be very annoying or offensive to others, but would not be a ground for denial of service. Nor would it be consistent with the nondiscrimination requirements of this part to deny service based on fear or misinformation about the disability. For example, a transit provider could not deny service to a person with HIV disease because its personnel or other passengers are afraid of being near people with that condition.

This section also prohibits denials of service or the placing on services of conditions inconsistent with this part on

individuals with disabilities because of insurance company policies or requirements. If an insurance company told a transit provider that it would withdraw coverage, or raise rates, unless a transit provider refused to carry persons with disabilities, or unless the provider refused to carry three-wheeled scooters, this would not excuse the provider from providing the service as mandated by this part. This is not a regulatory requirement on insurance companies, but simply says that covered entities must comply with this part even in the face of difficulties with their insurance companies.

#### Section 37.7 Standards for Accessible Vehicles

This section makes clear that, in order to meet accessibility requirements of this rule, vehicles must comply with Access Board standards, incorporated in DOT rules as 49 CFR part 38. Paragraph (b) of § 37.7 spells out a procedure by which an entity (public or private) can deviate from provisions of part 38 with respect to vehicles. The entity can make a case to the Administrator that it is unable to comply with a particular portion of part 38, as written, for specified reasons, and that it is providing comparable compliance by some alternative method. The entity would have to describe how its alternative mode of compliance would meet or exceed the level of access to or usability of the vehicle that compliance with part 38 would otherwise provide.

It should be noted that equivalent facilitation does not provide a means to get a waiver of accessibility requirements. Rather, it is a way in which comparable (not a lesser degree of) accessibility can be provided by other means. The entity must consult with the public through some means of public participation in devising its alternative form of compliance, and the public input must be reflected in the submission to the Administrator (or the Federal Railroad Administrator in appropriate cases, such as a request concerning Amtrak). The Administrator will make a case-by-case decision about whether compliance with part 38 was achievable and, if not, whether the proffered alternative complies with the equivalent facilitation standard. DOT intends to consult with the Access Board in making these determinations.

This equivalent facilitation provision can apply to buses or other motor vehicles as well as to rail cars and vehicles. An example of what could be an equivalent facilitation would concern rail cars which would leave too wide a horizontal gap between the door and the platform. If the operator used a combination of bridgeplates and personnel to bridge the gap, it might be regarded as an equivalent facilitation in appropriate circumstances.

Section 37.7(c) clarifies which specifications must be complied with for over-the-road buses purchased by public entities (under subpart D of part 37) or private entities standing in the shoes of the public entity (as described in § 37.23 of part 37). This section is necessary to make clear that over-the-road coaches must be accessible, when they are purchased by or in

furtherance of a contract with a public entity. While the October 4, 1990 rule specified that over-the-road coaches must be accessible under these circumstances, we had not previously specified what constitutes accessibility.

Accordingly, this paragraph specifies that an over-the-road bus must have a lift which meets the performance requirements of a regular bus lift (see § 38.23) and must meet the interim accessibility features specified for all over-the-road buses in part 3, subpart G.

#### *Section 37.9 Standards for Transportation Facilities*

This section makes clear that, in order to meet accessibility requirements of this rule, vehicles must comply with appendix A to part 37, which incorporates the Access Board facility guidelines.

Paragraph (b) of § 37.9 provides that, under certain circumstances, existing accessibility modifications to key station facilities do not need to be modified further in order to conform to appendix A. This is true even if the standards under which the facility was modified differ from the Access Board guidelines or provide a lesser standard of accessibility.

To qualify for this "grandfathering," alterations must have been before January 26, 1992. As in other facility sections of the rule, an alteration is deemed to begin with the issuance of a notice to proceed or work order. The existing modifications must conform to ANSI A-117.1, Specifications for Making Buildings and Facilities Accessible to and Usable by the Physically Handicapped 1990, or the Uniform Federal Accessibility Standard (UFAS).

For example, if an entity used a Federal grant or loan or money to make changes to a building, it would already have had to comply with the Uniform Federal Accessibility Standards. Likewise, if a private entity, acting without any federal money in the project, may have complied with the ANSI A117.1 standard. So long as the work was done in conformity with the standard that was in effect when the work was done, the alteration will be considered accessible.

However, because one modification was made to a facility under one of these standards, the entity still has a responsibility to make other modifications needed to comply with applicable accessibility requirements. For example, if an entity has made some modifications to a key station according to one of these older standards, but the modifications do not make the key station entirely accessible as this rule requires, then additional modifications would have to be made according to the standards of appendix A. Suppose this entity has put an elevator into the station to make it accessible to individuals who use wheelchairs. If the elevator does not fully meet appendix A standards, but met the applicable ANSI standard when it was installed, it would not need further modifications now. But if it had not already done so, the entity would have to install a tactile strip along the platform edge in order to make the key station fully accessible as provided in this rule. The tactile strip would have to meet appendix A requirements.

The rule specifically provides that "grandfathering" applies only to alterations of individual elements and spaces and only to the extent that provisions covering those elements or spaces are found in UFAS or AHSA A117.1. For example, alterations to the telephones in a key station may have been carried out in order to lower them to meet the requirements of UFAS, but telecommunications devices for the deaf (TDDs) were not installed. (Neither UFAS nor the ANSI standard include requirements concerning TDDs). However, because appendix A does contain TDD requirements, the key station must now be altered in accordance with the standards for TDDs. Similarly, earlier alteration of an entire station in accordance with UFAS or the ANSI standard would not relieve an entity from compliance with any applicable provision concerning the gap between the platform between the platform and the vehicle in a key station, because neither of these two standards addresses the interface between vehicle and platform.

New paragraph (c) of this section clarifies a provision of the Access Board's standards concerning the construction of bus stop pads at bus stops. The final Access Board standard (found at section 10.2.1(1) of appendix A to part 37) has been rewritten slightly to clear up confusion about the perceived necessary construction of a bus stop pad. Section 10.2.1(1) does not require that anyone build a bus stop pad; it does specify what a bus stop pad must look like, if it is constructed. The further clarifying language in § 37.9(c) explains that public entities must exert control over the construction of bus stop pads if they have the ability to do so. The Access Board, as well as DOT, recognize that most physical improvements related to bus stops are out of the control of the transit provider. Paragraph (c) of § 37.9 merely notes that where a transit provider does have control over the construction, it must exercise that control to ensure that the pad meets these specifications.

One further clarification concerning the implication of this provision deals with a bus loading island at which buses pull up on both sides of the island. It would be possible to read the bus pad specification to require the island to be a minimum of 84 inches wide (two widths of a bus stop pad), so that a lift could be deployed from buses on both sides of the island at the same time. A double-wide bus pad, however, is likely to exceed available space in most instances.

Where there is space, of course, building a double-wide pad is one acceptable option under this rule. However, the combination of a pad of normal width and standard operational practices may also suffice. (Such practices could be offered as an equivalent facilitation.) For example, buses on either side of the island could stop at staggered locations (i.e., the bus on the left side could stop several feet ahead of the bus on the right side), so that even when buses were on both sides of the island at once, their lifts could be deployed without conflict. Where it is possible, building the pad a little longer than normal size could facilitate such an approach. In a situation where staggered stop areas are

not feasible, an operational practice of having one bus wait until the other's lift cycle had been completed could do the job. Finally, the specification does not require that a pad be built at all. If there is nothing that can be done to permit lift deployment on both sides of an island, the buses can stop on the street, or some other location, so long as the lift is deployable.

Like § 37.7, this section contains a provision allowing an entity to request approval for providing accessibility through an equivalent facilitation.

#### *Section 37.11 Administrative Enforcement*

This section spells out administrative means of enforcing the requirements of the ADA. Recipients of Federal financial assistance from DOT (whether public or private entities) are subject to DOT's section 504 enforcement procedures. The existing procedures, including administrative complaints to the DOT Office of Civil Rights, investigation, attempts at conciliation, and final resort to proceedings to cut off funds to a noncomplying recipient, will continue to be used.

In considering enforcement matters, the Department is guided by a policy that emphasizes compliance. The aim of enforcement action, as we see it, is to make sure that entities meet their obligations, not to impose sanctions for their own sake. The Department's enforcement priority is on failures to comply with basic requirements and "pattern or practice" kinds of problems, rather than on isolated operational errors.

Under the DOJ rules implementing Title II of the ADA (28 CFR part 35), DOT is a "designated agency" for enforcement of complaints relating to transportation programs of public entities, even if they do not receive Federal financial assistance. When it receives such a complaint, the Department will investigate the complaint, attempt conciliation and, if conciliation is not possible, take action under section 504 and/or refer the matter to the DOJ for possible further action.

Title III of the ADA does not give DOT any administrative enforcement authority with respect to private entities whose transportation services are subject to part 37. In its Title III rule (28 CFR part 36), DOJ assumes enforcement responsibility for all Title III matters. If the Department of Transportation receives complaints of violations of part 37 by private entities, it will refer the matters to the DOJ.

It should be pointed out that the ADA includes other enforcement options. Individuals have a private right of action against entities who violate the ADA and its implementing regulations. The DOJ can take violators to court. These approaches are not mutually exclusive with the administrative enforcement mechanisms described in this section. An aggrieved individual can complain to DOT about an alleged transportation violation and go to court at the same time. Use of administrative enforcement procedures is not, under titles II and III, an administrative remedy that individuals must exhaust before taking legal action.

We also would point out that the ADA does not assert any blanket preemptive authority over state or local nondiscrimination laws and enforcement mechanisms. While requirements of the ADA and this regulation would preempt conflicting state or local provisions (e.g., a building code or zoning ordinance that prevents compliance with appendix A or other facility accessibility requirements, a provision of local law that said bus drivers could not leave their seats to help secure wheelchair users), the ADA and this rule do not prohibit states and localities from legislating in areas relating to disability. For example, if a state law requires a higher degree of service than the ADA, that requirement could still be enforced. Also, states and localities may continue to enforce their own parallel requirements. For example, it would be a violation of this rule for a taxi driver to refuse to pick up a person based on that person's disability. Such a refusal may also be a violation of a county's taxi rules, subjecting the violator to a fine or suspension of operating privileges. Both ADA and local remedies could proceed in such a case.

Labor-management agreements cannot stand in conflict with the requirements of the ADA and this rule. For example, if a labor-management agreement provides that vehicle drivers are not required to provide assistance to persons with disabilities in a situation in which this rule requires such assistance, then the assistance must be provided notwithstanding the agreement. Labor and management do not have the authority to agree to violate requirements of Federal law.

#### *Section 37.13 Effective Date for Certain Vehicle Lift Specifications.*

This section contains an explicit statement of the effective date for vehicle lift platform specifications. The Department has decided to apply the new 30" by 48" lift platform specifications to solicitations after January 25, 1992. As in the October 4, 1990, rule implementing the acquisition requirements; the date of a solicitation is deemed to be the closing date for the submission of bids or offers in a procurement.

#### **Subpart B—Applicability**

##### *Section 37.21 Applicability.—General*

This section emphasizes the broad applicability of part 37. Unlike section 504, the ADA and its implementing rules apply to entities whether or not they receive Federal financial assistance. They apply to private and public entities alike. For entities which do receive Federal funds, compliance with the ADA and part 37 is a condition of compliance with section 504 and 49 CFR part 27. DOT's section 504 rule.

Virtually all entities covered by this rule also are covered by DOJ rules, either under 28 CFR part 36 as state and local program providers or under 28 CFR part 35 as operators of places of public accommodation. Both sets of rules apply; one does not override the other. The DOT rules apply only to the entity's transportation facilities, vehicles, or services; the DOJ rules may cover the entity's activities more broadly. For example, if a public entity operates a transit system and a zoo, DOT's coverage would

stop at the transit system's edge, while DOJ's rule would cover the zoo as well.

DOT and DOJ have coordinated their rules, and the rules have been drafted to be consistent with one another. Should, in the context of some future situation, there be an apparent inconsistency between the two rules, the DOT rule would control within the sphere of transportation services, facilities and vehicles.

##### *Section 37.23 Service Under Contract*

This section requires private entities to "stand in the shoes" of public entities with whom they contract to provide transportation services. It ensures that, while a public entity may contract out its service, it may not contract away its ADA responsibilities. The requirement applies primarily to vehicle acquisition requirements and to service provision requirements.

If a public entity wishes to acquire vehicles for use on a commuter route, for example, it must acquire accessible vehicles. It may acquire accessible over-the-road buses, it may acquire accessible full-size transit buses, it may acquire accessible smaller buses, or it may acquire accessible vans. It does not matter what kind of vehicles it acquires, so long as they are accessible. On the other hand, if the public entity wants to use inaccessible buses in its existing fleet for the commuter service, it may do so. All replacement vehicles acquired in the future must, of course, be accessible.

Under this provision, a private entity which contracts to provide this commuter service stands in the shoes of the public entity and is subject to precisely the same requirements (it is not required to do more than the public entity). If the private entity acquires vehicles used to provide the service, the vehicles must be accessible. If it cannot, or chooses not to, acquire an accessible vehicle of one type, it can acquire an accessible vehicle of another type. Like the public entity, it can provide the service with inaccessible vehicles in its existing fleet.

The import of the provision is that it requires a private entity contracting to provide transportation service to a public entity to follow the rules applicable to the public entity. For the time being, a private entity operating in its own right can purchase a new over-the-road bus inaccessible to individuals who use wheelchairs. When that private entity operates service under contract to the public entity, however, it is just as obligated as the public entity itself to purchase an accessible bus for use in that service, whether or not it is an over-the-road bus.

The "stand in the shoes" requirement applies not only to vehicles acquired by private entities explicitly under terms of an executed contract to provide service to a public entity, but also to vehicles acquired "in contemplation of use" for service under such a contract. This language is included to ensure good faith compliance with accessibility requirements for vehicles acquired before the execution of a contract. Whether a particular acquisition is in contemplation of use on a contract will be determined on a case-by-case basis. However, acquiring a vehicle a short time

before a contract is executed and then using it for the contracted service is an indication that the vehicle was acquired in contemplation of use on the contract, as is acquiring a vehicle ostensibly for other service provided by the entity and then regularly rotating it into service under the contract.

The "stand in the shoes" requirement is applicable only to the vehicles and service (public entity service requirements, like § 37.163, apply to a private entity in these situations) provided under contract to a public entity. Public entity requirements clearly do not apply to all phases of a private entity's operations, just because it has a contract with a public entity. For example, a private bus company, if purchasing buses for service under contract to a public entity, must purchase accessible buses. The same company, to the extent permitted by the private entity provisions of this part, may purchase inaccessible vehicles for its tour bus operations.

The Department also notes that the "stands in the shoes" requirement may differ depending on the kind of service involved. The public entity's "shoes" are shaped differently, for example, depending on whether the public entity is providing fixed route or demand responsive service to the general public. In the case of demand responsive service, a public entity is not required to buy an accessible vehicle if its demand responsive system, when viewed in its entirety, provides service to individuals with disabilities equivalent to its service to other persons. A private contractor providing a portion of this paratransit service would not necessarily have to acquire an accessible vehicle if this equivalency test is being met by the system as a whole. Similarly, a public entity can, after going through a "good faith efforts" search, acquire inaccessible buses. A private entity under contract to the public can do the same. "Stand in the shoes" may also mean that, under some circumstances, a private contractor need not acquire accessible vehicles. If a private company contracts with a public school district to provide school bus service, it is covered, for that purpose, by the exemption for public school transportation.

In addition, the requirement that a private entity play by the rules applicable to a public entity can apply in situations involving an "arrangement or other relationship" with a public entity other than the traditional contract for service. For example, a private utility company that operates what is, in essence, a regular fixed route public transportation system for a city, and which receives section 3 or 9 funds from UMTA via an agreement with a state or local government agency, would fall under the provisions of this section. The provider would have to comply with the vehicle acquisition, paratransit, and service requirements that would apply to the public entity through which it receives the UMTA funds, if that public entity operated the system itself. The Department would not, however, construe this section to apply to situations in which the degree of UMTA funding and state and local agency involvement is considerably



less, or in which the system of transportation involved is not a *de facto* surrogate for a traditional public entity fixed route transit system serving a city (e.g., a private non-profit social service agency which receives UMTA section 16(b)(2) funds to purchase a vehicle).

This section also requires that a public entity not diminish the percentage of accessible vehicles in its fleet through contracting. For example, suppose a public entity has 100 buses in its fleet, of which 20 are accessible, meaning that 20 percent of its fleet is accessible. The entity decides to add a fixed route, for which a contractor is engaged. The contractor is supplying ten of its existing inaccessible buses for the fixed route. To maintain the 20 percent accessibility ratio, there would have to be 22 accessible buses out of the 110 buses now in operation in carrying out the public entity's service. The public entity could maintain its 20 percent level of accessibility through any one or more of a number of means, such as having the contractor to provide two accessible buses, retrofitting two of its own existing buses, or accelerating replacement of two of its own inaccessible buses with accessible buses.

This rule applies the "stand in the shoes" principle to transactions wholly among private entities as well. For example, suppose a taxi company (a private entity primarily engaged in the business of transporting people) contracts with a hotel to provide airport shuttle van service. With respect to that service, the taxi company would be subject to the requirements for private entities not primarily in the business of transporting people, since it would be "standing in the shoes" of the hotel for that purpose.

#### Section 37.25 University Transportation Systems

Private university-operated transportation systems are subject to the requirements of this rule for private entities not primarily engaged in the business of transporting people. With one important exception, public university-operated transportation systems are subject to the requirements of the rule for public entities. The nature of the systems involved—demand-responsive or fixed route—determines the precise requirements involved.

For public university fixed route systems, public entity requirements apply. In the case of fixed route systems, the requirements for commuter bus service would govern. This has the effect of requiring the acquisition of accessible vehicles and compliance with most other provisions of the rule, but does not require the provision of complementary paratransit or submitting a paratransit plan. As a result, private and public universities will have very similar obligations under the rule.

#### Section 37.27 Transportation for Elementary and Secondary Education Systems

This section restates the statutory exemption from public entity requirements given to public school transportation. This extension also applies to transportation of

pre-school children to Head Start or special education programs which receive Federal assistance. It also applies to arrangements permitting pre-school children of school bus drivers to ride a school bus or allowing teenage mothers to be transported to day care facilities at a school or along a school bus route so that their mothers may continue to attend school (See H. Rept. 101-485, pt. 1 at 27). The situation for private schools is more complex. According to the provision, a private elementary or secondary school's transportation system is exempt from coverage under this rule if all three of the following conditions are met: (1) The school receives Federal financial assistance; (2) the school is subject to section 504; and (3) the school's transportation system provides transportation services to individuals with disabilities, including wheelchair users, equivalent to those provided to individuals without disabilities. The test of equivalency is the same as that for other private entities, and is described under § 37.105. If the school does not meet all these criteria, then it is subject to the requirements of Part 37 for private entities not primarily engaged in the business of transporting people.

The Department notes that, given the constitutional law on church-state separation, it is likely that church-affiliated private schools do not receive Federal financial assistance. To the extent that these schools' transportation systems are operated by religious entities or entities controlled by religious organizations, they are not subject to the ADA at all, so this section does not apply to them.

#### Section 37.29 Private Providers of Taxi Service

This section first recites that providers of taxi service are private entities primarily engaged in the business of transporting people which provide demand responsive service. For purposes of this section, other transportation services that involve calling for a car and a driver to take one places (e.g., limousine services, of the kind that provide luxury cars and chauffeurs for senior proms and analogous adult events) are regarded as taxi services.

Under the ADA, no private entity is required to purchase an accessible automobile. If a taxi company purchases a larger vehicle, like a van, it is subject to the same rules as any other private entity primarily engaged in the business of transporting people which operates a demand responsive service. That is, unless it is already providing equivalent service, any van it acquires must be accessible. Equivalent service is measured according to the criteria of § 37.105. Taxi companies are not required to acquire vehicles other than automobiles to add accessible vehicles to their fleets.

Taxi companies are subject to nondiscrimination obligations. These obligations mean, first, that a taxi service may not deny a ride to an individual with a disability who is capable of using the taxi vehicles. It would be discrimination to pass up a passenger because he or she was blind or used a wheelchair, if the wheelchair was one that could be stowed in the cab and the passenger could transfer to a vehicle seat.

Nor could a taxi company insist that a wheelchair user wait for a lift-equipped van if the person could use an automobile.

It would be discrimination for a driver to refuse to assist with stowing a wheelchair in the trunk (since taxi drivers routinely assist passengers with stowing luggage). It would be discrimination to charge a higher fee or fare for carrying a person with a disability than for carrying a non-disabled passenger, or a higher fee for stowing a wheelchair than for stowing a suitcase. (Charging the same fee for stowing a wheelchair as for stowing a suitcase would be proper, however.) The fact that it may take somewhat more time and effort to serve a person with a disability than another passenger does not justify discriminatory conduct with respect to passengers with disabilities.

State or local governments may run user-side subsidy arrangements for the general public (e.g., taxi voucher systems for senior citizens or low-income persons). Under the DOJ title II rule, these programs would have to meet "program accessibility" requirements, which probably would require that accessible transportation be made available to senior citizens or low-income persons with disabilities. This would not directly require private taxi providers who accept the vouchers to purchase accessible vehicles beyond the requirements of this rule, however.

#### Section 37.31 Vanpools

This provision applies to public vanpool systems the requirements for public entities operating demand responsive systems for the general public. A public vanpool system is one operated by a public entity, or in which a public entity owns or purchases or leases the vehicles. Lesser degrees of public involvement with an otherwise private ridesharing arrangement (e.g., provision of parking spaces, HOV lanes, coordination or clearinghouse services) do not convert a private into a public system.

The requirement for a public vanpool system is that it purchase or lease an accessible vehicle unless it can demonstrate that it provides equivalent service to individuals with disabilities, including individuals who use wheelchairs, as it provides to individuals without disabilities. For a public vanpool system, the equivalency requirement would be met if an accessible vehicle is made available to and used by a vanpool when an individual with a disability needs such a vehicle to participate. Public vanpool systems may meet this requirement through obtaining a percentage of accessible vehicles that is reasonable in light of demand for them by participants, but this is not required, so long as the entity can respond promptly to requests for participation in a vanpool with the provision of an accessible van when needed.

There is no requirement for private vanpools, defined as a voluntary arrangement in which the driver is compensated only for expenses.

#### Section 37.33 Airport Transportation Systems

Fixed route transportation systems operated by public airports are regarded by

this section as fixed route commuter bus systems. As such, shuttles among terminals and parking lots, connector systems among the airport and a limited number of other local destinations must acquire accessible buses, but are not subject to complementary paratransit requirements. (If a public airport operates a demand responsive system for the general public, it would be subject to the rules for demand responsive systems for the general public.)

It should be noted that this section applies only to transportation services that are operated by public airports themselves (or by private contractors who stand in their shoes). When a regular urban mass transit system serves the airport, the airport is simply one portion of its service area, treated for purposes of this rule like the rest of its service area.

Virtually all airports are served by taxi companies, who are subject to § 37.29 at airports as elsewhere. In addition, many airports are served by jitney or shuttle systems. Typically, these systems operate in a route-deviation or similar variable mode in which there are passenger-initiated decisions concerning destinations. We view such systems as demand responsive transportation operated by private entities primarily engaged in the business of transporting people.

Since many of these operators are small businesses, it may be difficult for them to meet equivalency requirements on their own without eventually having all or nearly all accessible vehicles, which could pose economic problems. One suggested solution to this problem is for the operators serving a given airport to form a pool or consortium arrangement, in which a number of shared accessible vehicles would meet the transportation needs of individuals with disabilities. As in other forms of transportation, such an arrangement would have to provide service in a nondiscriminatory way (e.g., in an integrated setting, no higher fares for accessible service).

#### *Section 37.34 Supplemental Service for Other Transportation Modes*

This section applies to a number of situations in which an operator of another transportation mode uses bus or other service to connect its service with limited other points.

One instance is when an intercity railroad route is set up such that the train stops outside the major urban center which is the actual destination for many passengers. Examples mentioned to us include bus service run by Amtrak from a stop in Columbus, Wisconsin, to downtown Madison, or from San Jose to San Francisco. Such service is fixed route, from the train station to a few points in the metropolitan area, with a schedule keyed to the train schedule. It would be regarded as commuter bus service, meaning that accessible vehicles would have to be acquired but complementary paratransit was not required.

Another instance is one in which a commuter rail operator uses fixed route bus service as a dedicated connection to, or extension of, its rail service. The service may

go to park and ride lots or other destinations beyond the vicinity of the rail line. Again, this service shares the characteristics of commuter bus service that might be used even if the rail line were not present, and does not attempt to be a comprehensive mass transit bus service for the area.

Of course, there may be instances in which a rail operator uses demand responsive instead of fixed route service for a purpose of this kind. In that case, the demand responsive system requirements of the rule would apply.

Private entities (i.e., those operating places of public accommodation) may operate similar systems, as when a cruise ship operator provides a shuttle or connector between an airport and the dock. This service is covered by the rules governing private entities not primarily engaged in the business of transporting people. Fixed route or demand responsive rules apply, depending on the characteristics of the system involved.

One situation not explicitly covered in this section concerns *ad hoc* transportation arranged, for instance, by a rail operator when the train does not wind up at its intended destination. For example, an Amtrak train bound for Philadelphia may be halted at Wilmington by a track blockage between the two cities. Usually, the carrier responds by providing bus service to the scheduled destination or to the next point where rail service can resume.

The service that the carrier provides in this situation is essentially a continuation by other means of its primary service. We view the obligation of the rail operator as being to ensure that all passengers, including individuals with disabilities, are provided service to the destination in a nondiscriminatory manner. This includes, for instance, providing service in the most integrated setting appropriate to the needs of the individual and service that gets a passenger with a disability to the destination as soon as other passengers.

#### *Section 37.37 Other Applications*

The ADA specifically defines "public entity." Anything else is a "private entity." The statute does not include in this definition a private entity that receives a subsidy or franchise from a state or local government or is regulated by a public entity. Only through the definition of "operates" (see discussion of § 37.23) do private entities' relationships to public entities subject private entities to the requirements for public entities. Consequently, in deciding which provisions of the rule to apply to an entity in other than situations covered by § 37.23, the nature of the entity—public or private—is determinative.

Transportation service provided by public accommodations is viewed as being provided by private entities not primarily engaged in the business of transporting people. Either the provisions of this Part applicable to demand responsive or fixed route systems apply, depending on the nature of a specific system at a specific location. The distinction between fixed route and demand responsive systems is discussed in connection with the definitions section above. It is the responsibility of each private entity, in the first instance, to assess the nature of each

transportation system on a case-by-case basis and determine the applicable rules.

On the other hand, conveyances used for recreational purposes, such as amusement park rides, ski lifts, or historic rail cars or trolleys operated in museum settings, are not viewed as transportation under this rule at all. Other conveyances may fit into this category as well.

The criterion for determining what requirements apply is whether the conveyances are primarily an aspect of the recreational experience itself or a means of getting from Point A to Point B. At a theme park, for instance, a large roller coaster (though a "train" of cars on a track) is a public accommodation not subject to this rule; the tram that transports the paying customers around the park, with a stop at the roller coaster, is a transportation system subject to the "private, not primarily" provisions of this part.

Employer-provided transportation for employees is not covered by this Part, but by EEOC rules under title I of the ADA. (Public entities are also subject to DOJ's title II rules with respect to employment.) This exclusion from part 37 applies to transportation services provided by an employer (whether access to motor pool vehicles, parking shuttles, employer-sponsored van pools) that is made available solely to its own employees. If an employer provides service to its own employees and other persons, such as workers of other employers or customers, it would be subject to the requirements of this Part from private entities not primarily engaged in the business of transporting people or public entities, as applicable.

The rule looks to the private entity actually providing the transportation service in question in determining whether the "private, primarily" or "private, not primarily" rules apply. For example, Conglomerate, Inc., owns a variety of agribusiness, petrochemical, weapons system production, and fast food corporations. One of its many subsidiaries, Green Tours, Inc., provides charter bus service for people who want to view National Parks, old-growth forests, and other environmentally significant places. It is probably impossible to say in what business Conglomerate, Inc. is primarily engaged, but it clearly is not transporting people. Green Tours, Inc., on the other hand, is clearly primarily engaged in the business of transporting people, and the rule treats it as such.

On the other hand, when operating a transportation service off to the side of the main business of a public accommodation (e.g., a hotel shuttle), the entity as a whole would be considered. Even if some dedicated employees are used to provide the service, shuttles and other systems provided as a means of getting to, from, or around a public accommodation remain solidly in the "private, not primarily" category.

#### **Subpart C—Transportation Facilities**

##### *Section 37.41 Construction of Transportation Facilities by Public Entities*

Section 37.41 contains the general requirement that all new facilities constructed after January 25, 1992, be

accessible to and usable by individuals with disabilities. This provision tracks the statute closely, and is analogous to a provision in the DOJ regulations for private entities. Section 226 of the ADA provides little discretion in this requirement.

The requirement is keyed to construction which "begins" after January 25, 1992. The regulation defines "begin" to mean when a notice to proceed order has been issued. This term has a standard meaning in the construction industry, as an instruction to the contractor to proceed with the work.

Questions have been raised concerning which standards apply before January 26, 1992. There are Federal requirements that apply to all recipients of federal money, depending on the circumstances.

First, if an entity is a Federal recipient and uses Federal dollars to construct the facility, regulations implementing section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794) require the recipient to comply with the Uniform Federal Accessibility Standards.

Second, since the Civil Rights Restoration Act of 1987 (Pub. L. 100-259), an operation of a recipient of federal funds would also have to comply with section 504, even though the activity was not paid for with Federal funds. Thus, the Uniform Federal Accessibility Standards would apply to this construction as well.

As mentioned above, the Department intends, in the period before January 26, 1992, to view compliance with section 504 in light of compliance with ADA requirements (this point applies to alterations as well as new construction). Consequently, in reviewing requests for grants, contract approvals, exemptions, etc., (whether with respect to ongoing projects or new, experimental, or one-time efforts), the Department will, as a policy matter, seek to ensure compliance with ADA standards.

#### *Section 37.43 Alteration of Transportation Facilities by Public Entities*

This section sets out the accessibility requirements that apply when a public entity undertakes an alteration of an existing facility. In general, the section requires that any alteration, to the maximum extent feasible, results in the altered area being accessible to and usable by individuals with disabilities, including persons who use wheelchairs. The provisions follow closely those adopted by the DOJ, in its regulations implementing title III of the ADA.

The section requires specific activities whenever an alteration of an existing facility is undertaken.

First, if the alteration is made to a primary function area, (or access to an area containing a primary function), the entity shall make the alteration in such a way as to ensure that the path of travel to the altered area and the restrooms, telephones and drinking fountains servicing the altered area are readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

Second, alterations to drinking fountains, telephones, and restrooms do not have to be completed if the cost and scope of making them accessible is disproportionate.

Third, the requirement goes into effect for alterations begun after January 25, 1992.

Fourth, the term "maximum extent feasible" means that all changes that are possible must be made. The requirement to make changes to the maximum extent feasible derives from clear legislative history. The Senate Report states—

The phrase "to the maximum extent feasible" has been included to allow for the occasional case in which the nature of an existing facility is such as to make it virtually impossible to renovate the building in a manner that results in its being entirely accessible to and usable by individuals with disabilities. In all such cases, however, the alteration should provide the maximum amount of physical accessibility feasible.

Thus, for example the term "to the maximum extent feasible" should be construed as not requiring entities to make building alterations that have little likelihood of being accomplished without removing or altering a load-bearing structural member unless the load-bearing structural member is otherwise being removed or altered as part of the alteration. (S. Rept. 101-116, at 68).

Fifth, primary function means a major activity for which the facility is intended. Primary function areas include waiting areas, ticket purchase and collection areas, train or bus platforms, baggage checking and return areas, and employment areas [with some exceptions stated in the rule, for areas used by service personnel that are very difficult to access].

Sixth, "path of travel" means a continuous, unobstructed way of pedestrian passage by means of which the altered area may be approached, entered, and exited, and which connects the altered area with an exterior approach and includes restrooms, telephones, and drinking fountains serving the altered area. If changes to the path of travel are disproportionate, then only those changes which are not disproportionate are to be completed.

Seventh, the final rule specifies that costs exceeding 20 percent would be disproportionate. This is consistent with the DOJ. In determining costs, the Department intends costs to be based on changes to the passenger service area that is scheduled for alteration.

Finally, the Department has defined the term "begin," in the context of begin an alteration that is subject to the alteration provision to mean when a notice to proceed or work order is issued. Two terms are used (instead of only notice to proceed in the context of new construction) because many alterations may be carried out by the entity itself, in which case the only triggering event would be a work order or similar authorization to begin.

In looking at facility concepts like "disproportionality" and "to the maximum extent feasible," the Department will consider any expenses related to accessibility for passengers. It is not relevant to consider non-passenger related improvements (e.g., installing a new track bed) or to permit "gold-plating" (attributing to accessibility costs the expense of non-related improvements, such as charging to accessibility costs the price of a whole new door, when only adding a new handle to the old door was needed for accessibility).

#### *Section 37.47 Key Stations in Light and Rapid Rail Systems*

#### *Section 37.51 Key Stations in Commuter Rail Systems*

These sections require that key stations in light, rapid, and commuter rail systems be made accessible as soon as practicable, but no later than July 26, 1993. Being made accessible, for this purpose, means complying with the applicable provisions of appendix A to this part. "As soon as practicable" means that, if modification can be made before July 26, 1993, they must be. A rail operator that failed to make a station accessible by July 1993 would be in noncompliance with the ADA and this rule, except in a case where an extension of time had been granted.

What is a key station? A key station is one designated as such by the commuter authority or light/rapid rail operator, through the planning process and public participation process set forth in this section. The five criteria listed in the regulation are intended to guide the selection process but, while the entity must take these criteria into account (and this consideration must be reflected in the planning process and documents), they are not mandatory selection standards. That is, it is not required that every station that meets one of the criteria be designated as a key station. Since the criteria are not mandatory selection standards, the understanding of their terms is also a matter appropriately left to the planning process. A tight, legalistic definition is not necessary in the context of factors intended for consideration. For instance, what constitutes a major activity center or how close a station needs to be to another station to not be designated as key depend largely on local factors that it would not be reasonable to specify in this rule.

Given the wide discretion permitted to rail operators in identifying key stations, there would be no objection to identifying as a key station a new (presumably accessible) station now under construction. Doing so would involve consideration of the key station criteria and would be subject to the planning/public participation process.

If an extension to a rail system (e.g., a commuter system) is made, such that the system comes to include existing inaccessible stations that have not previously been part of the system, the Department construes the ADA to require application of key station accessibility in such a situation. The same would be true for a new commuter rail system that began operations using existing stations. Key station planning, designation of key stations, and with being consistent with the ADA would be required. The Department would work with the commuter authority involved on a case-by-case basis to determine applicable time limits for accessibility, consistent with the time frames of the ADA.

The entity must develop a compliance plan, subject to the public participation and planning process set forth in paragraph (d) of each of these sections. Note that this plan must be completed by July 26, 1992, not January 26, 1993, as in the case of paratransit plans. The key station plans must be



submitted to UMTA at that time. (The statute does not require UMTA approval of the plans, however.)

A rail operator may request an extension of the July 1993 completion deadline for accessibility modifications to one or more key stations. The extension for light and rapid rail stations can be up to July 2020, though two thirds of the key stations (per the legislative history of the statute, selected in a way to maximize accessibility to the whole system) must be accessible by July 2010.

Commuter rail stations can be extended up to July 2010.

Requests for extension of time must be submitted by July 26, 1992. UMTA will review the requests on a station-by-station basis according to the statutory criterion, which is whether making the station accessible requires extraordinarily expensive alterations. An extraordinarily expensive alteration is raising the entire platform, installing an elevator, or making another alteration of similar cost and magnitude. If another means of making a station accessible (e.g., installation of a mini-high platform in a station where it is not necessary to install an elevator for to provide access to the platform for wheelchair users), then an extension can be granted only if the rail operator shows that the cost and magnitude of the alteration is similar in to that of an elevator installation or platform raising.

The rule does not include a specific deadline for UMTA consideration of an extension request. However, since we are aware that, in the absence of an extension request, accessibility must be completed by July 1993, we will endeavor to complete review of plans as soon as possible, to give as much lead time as possible to local planning and implementation efforts.

Once an extension is granted, the extension applies to all accessibility modifications in the station. However, the rail operator should not delay non-extraordinarily expensive modifications to the station. The key station plan and any extension request should include a schedule for phasing in non-extraordinarily expensive modifications to the station. For example, even if a key station is not going to be accessible to wheelchair users for 15 years, pending the installation of an elevator, the rail operator can improve its accessibility to persons with visual impairments by installing tactile strips.

An extension cannot be granted except for a particular station which needs an extraordinarily expensive modification. An extension cannot be granted non-extraordinarily expensive changes to Station B because the extraordinarily expensive changes to Station A will absorb many resources. Non-extraordinarily expensive changes, however costly considered collectively for a system, are not, under the statute, grounds for granting an extension to one or more stations or the whole system. Only particular stations where an extraordinarily expensive modification must be made qualify for extensions.

The UMTA Administrator can approve, modify, or disapprove any request for an extension. For example, it is not a forgone conclusion that a situation for which an

extension is granted will have the maximum possible extension granted. If it appears that the rail operator can make some stations accessible sooner, UMTA can grant an extension for a shorter period (e.g., 2005 for a particular station rather than 2010).

#### *Section 37.49 Designation of Responsible Person(s) for Intercity and Commuter Rail Stations*

This section sets forth a mechanism for determining who bears the legal and financial responsibility for accessibility modifications to a commuter and/or intercity rail station. The final provision of the section is the most important. It authorizes all concerned parties to come to their own agreement concerning the allocation of responsibility. Such an agreement can allocate responsibility in any way acceptable to the parties. The Department strongly encourages parties to come to such an agreement.

In the absence of such an agreement, a statutory/regulatory scheme allocates responsibility. In the first, and simplest, situation posed by the statute, a single public entity owns more than 50 percent of the station. In this case, the public entity is the responsible person and nobody else is required to bear any of the responsibility.

In the second situation, a private entity owns more than 50 percent of the station. The private entity need not bear any of the responsibility for making the station accessible. A public entity owner of the station, who does not operate passenger railroad service through the station, is not required to bear any of the responsibility for making the station accessible. The total responsibility is divided between passenger railroads operating service through the station, on the basis of respective passenger boardings. If there is only one railroad operating service through the station, it bears the total responsibility.

The Department believes that reference to passenger boardings is the most equitable way of dividing responsibility among railroads, since the number of people drawn to the station by each is likely to reflect "cost causation" quite closely. The Department notes, however, that, as passenger boarding percentages change over time, the portion of responsibility assigned to each party also may change. Station modifications may involve long-term capital investment and planning, while passenger boarding percentages are more volatile. Some railroads may stop serving a station, while others may begin serving, during the period of time before modifications to the station are complete. To help accommodate such situations, the rule refers to passenger boardings "over the entire period during which the station is made accessible."

This language is intended to emphasize that as circumstances change, the parties involved have the responsibility to adjust their arrangements for cost sharing. For example, suppose Railroad A has 30 percent of the passenger boardings in year 1, but by year 10 has 60 percent of the boardings. It would not be fair for Railroad A to pay only 30 percent of the costs of station modifications occurring in later years. Ultimately, the total cost burden for

modifying the station over (for example) 20 years would be allocated on the share of the total number of boardings attributable to each railroad over the whole 20 year period, in order to avoid such unfairness.

The third, and most complicated, situation is one in which no party owns 50 percent of the station. For example, consider the following hypothetical situation:

Party	Ownership percentage	Boardings percentage
Private freight RR .....	40	0
City .....	30	0
Amtrak .....	0	25
Commuter A .....	30	50
Commuter B .....	0	25

The private freight railroad drops out of the calculation of who is responsible. All of the responsibility would be allocated among four public entities: the city (a public entity who does not operate railroad service), Amtrak, and the two commuter railroads. Half the responsibility would go to public entity owners of the station (whether or not they are railroads who run passenger service through the station). The other half of the responsibility would go to railroads who run passenger service through the station (whether or not they are station owners).

On the ownership side of the equation, the city and Commuter A each own half of that portion of the station that is not owned by the private freight railroad. Therefore, the two parties divide up the ownership half of the responsibility equally. Based on their ownership interest, each of these two parties bears 25 percent of the responsibility for the entire station. Note that, should ownership percentages or owners change over the period during which the station is to be made accessible, these percentages may change. It is ownership percentage over this entire period that ultimately determines the percentage of responsibility.

On the passenger rail operations side of the equation, 50 percent of passenger boardings are attributable to Commuter A and 25 percent each to Commuter B and Amtrak. Therefore, half of this portion of the responsibility belongs to Commuter A, while a quarter share each goes to the other railroads. This means that, based on passenger boardings, 25 percent of the responsibility goes to Commuter A, 12.5 percent to Commuter B, and 12.5 percent to Amtrak. Again, it is the proportion of passenger boardings over the entire length of the period during which the station is made accessible that ultimately determines the percentage of responsibility.

In this hypothetical, Commuter A is responsible for a total of 50 percent of the responsibility for the station. Commuter A is responsible for 25 percent of the responsibility because of its role as a station owner and another 25 percent because of its operation of passenger rail service through the station.

The Department recognizes that there will be situations in which application of this scheme will be difficult (e.g., involving problems with multiple owners of a station

whose ownership percentages may be difficult to ascertain). The Department again emphasizes that agreement among the parties is the best way of resolving these problems, but we are willing to work with the parties to ensure a solution consistent with this rule.

*Section 37.53 Exception for New York and Philadelphia*

Consistent with the legislative history of the ADA, this section formally recognizes the selection of key stations in two identified litigation settlement agreements in New York and Philadelphia as in compliance with the ADA. Consequently, the entities involved can limit their key station planning process to issues concerning the timing of key station accessibility. The section references also § 37.9, which provides that key station accessibility alterations which have already been made, or which are begun before January 26, 1992, and which conform to specified prior standards, do not have to be re-modified. On the other hand, alterations begun after January 25, 1992 (including forthcoming key station modifications under the New York and Philadelphia agreements), must meet the requirements of appendix A to this part.

This is an exception only for the two specified agreements. There are no situations in which other cities can take advantage of this provision. Nor are the provisions of the two agreements normative for other cities. Other cities must do their own planning, with involvement from local citizens, and cannot rely on agreements unique to New York and Philadelphia to determine the appropriate number of percentage of key stations or other matters.

*Section 37.57 Required Cooperation*

This section implements § 242(e)(2)(C) of the ADA, which treats as discrimination a failure, by an owner or person in control of an intercity rail station, to provide reasonable cooperation to the responsible persons' efforts to comply with accessibility requirements. For example, the imposition by the owner of an unreasonable insurance bond from the responsible person as a condition of making accessibility modifications would violate this requirement. See H. Rept. 101-485 at 53.

The statute also provides that failure of the owner or person in control to cooperate does not create a defense to a discrimination suit against the responsible person, but the responsible person would have a third party action against the uncooperative owner or person in control. The rule does not restate this portion of the statute in the regulation, since it would be implemented by the courts if such an action is brought. Since cooperation is also a regulatory requirement, however, the Department could entertain a section 504 complaint against a recipient of Federal funds who failed to cooperate.

The House Energy and Commerce Committee provided as an example of an action under this provision a situation in which a failure to cooperate leads to a construction delay, which in turn leads to a lawsuit by an individual with disabilities against the responsible person for missing an accessibility deadline. The responsible

person could not use the lack of cooperation as a defense in the lawsuit, but the uncooperative party could be made to indemnify the responsible person for damages awarded the plaintiff. Also, a responsible person could obtain an injunction to force the recalcitrant owner or controller of the station to permit accessibility work to proceed. (*Id.*)

This provision does not appear to be intended to permit a responsible person to seek contribution for a portion of the cost of accessibility work from a party involved with the station whom the statute and § 37.49 do not identify as a responsible person. It simply provides a remedy for a situation in which someone impedes the responsible person's efforts to comply with accessibility obligations.

*Section 37.59 Differences in Accessibility Completion Date Requirements*

Portions of the same station may have different accessibility completion date requirements, both as the result of different statutory time frames for different kinds of stations and individual decisions made on requests for extension. The principle at work in responding to such situations is that if part of a station may be made accessible after another part, the "late" part of the work should not get in the way of people's use of modifications resulting from the "early" part.

For example, the commuter part of a station may have to be made accessible by July 1993 (e.g., there is no need to install an elevator, and platform accessibility can be achieved by use of a relatively inexpensive mini-high platform). The Amtrak portion of the same station, by statute, is required to be accessible as soon as practicable, but no later than July 2010. If there is a common entrance to the station, that commuter rail passengers and Amtrak passengers both use, or a common ticket counter, it would have to be accessible by July 1993. If there were a waiting room used by Amtrak passengers but not commuter passengers (who typically stand and wait on the platform at this station), it would not have to be accessible by July 1993, but if the path from the common entrance to the commuter platform went through the waiting room, the path would have to be an accessible path by July 1993.

*Section 37.61 Public Transportation Programs and Activities in Existing Facilities*

This section implements section 228(a) of the ADA and establishes the general requirement for entities to operate their transportation facilities in a manner that, when viewed in its entirety, is accessible to and usable by individuals with disabilities. The section clearly excludes from this requirement access by persons in wheelchairs, unless these changes would be necessitated by the alterations or key station provisions.

This provision is intended to cover activities and programs of an entity that do not rise to the level of alteration. Even if an entity is not making alterations to a facility, it has a responsibility to conduct its program in an accessible manner. Examples of possible activities include user friendly farecards, schedules, of edge detection on rail platforms.

adequate lighting, telecommunication display devices (TDDs) or text telephones, and other accommodations for use by persons with speech and hearing impairments, signage for people with visual impairments, continuous pathways for persons with visual and ambulatory impairments, and public address systems and clocks.

The Department did not prescribe one list of things that would be appropriate for all stations. For example, we believe that tactile strips are a valuable addition to platforms which have drop-offs. We also believe that most larger systems, to the extent they publish schedules, should make those schedules readily available in alternative formats. We encourage entities to find this another area which benefits from its commitment to far-reaching public participation efforts.

**Subpart D—Acquisition of Accessible Vehicles by Public Entities**

*Section 37.71 Purchase or Lease of New Non-Rail Vehicles by Public Entities Operating Fixed Route Systems*

This section sets out the basic acquisition requirements for a public entity purchasing a new vehicle. Generally, the section requires any public entity who purchases or leases a new vehicle to acquire an accessible vehicle. There is a waiver provision if lifts are unavailable and these provisions track the conditions in the ADA. One statutory condition, that the public entity has made a good faith effort to locate a qualified manufacturer to supply the lifts, presumes a direct relationship between the transit provider and the lift manufacturer. In fact, it is the bus manufacturer, rather than the transit provider directly, who would have the task of looking for a supplier of lifts to meet the transit provider's specifications. The task must still be performed, but the regulation does not require the transit provider to obtain actual information about available lifts. Rather the bus manufacturer obtains the information and provides this assurance to the entity applying for the waiver, and the entity may rely on this representation. More specifically, the regulation requires that each waiver request must include a copy of the written solicitation (showing that it requested lift-equipped vehicles) and written responses from lift manufacturers to the vehicle manufacturer documenting their inability to provide the lifts. The information from the lift manufacturer must also include when the lifts will be available.

In addition, the waiver request must include copies of advertisements in trade publications and inquiries to trade associations seeking lifts for the buses. The public entity also must include a full justification for the assertion that a delay in the bus procurement sufficient to obtain a lift-equipped bus would significantly impair transportation services in the community. There is no length of time that would be a *per se* delay constituting a "significant impairment". It will be more difficult to obtain a waiver if a relatively short rather than relatively lengthy delay is involved. A showing of timetables, absent a showing of significant impairment of actual transit



services, would not form a basis for granting a waiver.

Any waiver granted by the Department under this provision will be a conditional waiver. The conditions are intended to ensure that the waiver provision does not create a loophole in the accessible vehicle acquisition requirement that Congress intended to impose. The ADA requires a waiver to be limited in duration and the rule requires a termination date to be included. The date will be established on the basis of the information the Department receives concerning the availability of lifts in the waiver request and elsewhere. In addition, so that a waiver does not become open-ended, it will apply only to a particular procurement. If a transit agency wants a waiver for a subsequent delivery of buses in the procurement, or another procurement entirely, it will have to make a separate waiver request.

For example, if a particular order of buses is delivered over a period of time, each delivery would be the potential subject of a waiver request. First, the entity would request a waiver for the first shipment of buses. If all of the conditions are met, the waiver would be granted, with a date specified to coincide with the due date of the lifts. When the lifts become available those buses would have to be retrofitted with the lifts. A subsequent delivery of buses—on the same order—would have to receive its own waiver, subject to the same conditions and specifications of the first waiver.

The purpose of the waiver, as the Department construes it, is to address a situation in which (because of a sudden increase in the number of lift-equipped buses requested) lift manufacturers are unable to produce enough lifts to meet the demand in a timely fashion.

#### *Section 37.73 Purchase or Lease of Used Non-Rail Vehicles by Public Entities Operating a Fixed Route System*

The basic rule is that an acquisition of a used vehicle would have to be for an accessible vehicle.

There is an exception, however, for situations in which the transit provider makes a good faith effort to obtain accessible used vehicles but does not succeed in finding them. The ADA requires transit agencies to purchase accessible used vehicles, providing a "demonstrated good faith efforts" exception to the requirement. The reports of the Senate Committee on Labor and Human Resources and the House Committee on Education and Labor offered the following guidance on what "good faith efforts" involve:

The phrase "demonstrated good faith efforts" is intended to require a nationwide search and not a search limited to a particular region. For instance, it would not be enough for a transit operator to contact only the manufacturer where the transit authority usually does business to see if there are accessible used buses. It involves the transit authority advertising in a trade magazine, i.e., Passenger Transport, or contacting the transit trade association, American Public Transit Association (APTA), to determine whether accessible used vehicles are available. It is the Committee's

expectation that as the number of buses with lifts increases, the burden on the transit authority to demonstrate its inability to purchase accessible vehicles despite good faith efforts will become more and more difficult to satisfy. S.Rept. 101-116 at 49; H.Rept. 101-465 at 90.

Consistent with this guidance, this section requires that good faith efforts include specifying accessible vehicles in bid solicitations. The section also requires that the entity retain for two years documentation of that effort, and that the information be available to UMTA and the public.

It does not meet the good faith efforts requirement to purchase inaccessible, rather than accessible, used buses, just because the former are less expensive, particularly if the difference is a difference attributable to the presence of a lift. There may be situations in which good faith efforts involve buying fewer accessible buses in preference to more inaccessible buses.

The public participation requirements involved in the development of the paratransit plans for all fixed route operators requires an ongoing relationship, including extensive outreach, to the community likely to be using its accessible service. We believe that it will be difficult to comply with the public participation requirements and not involve the affected community in the decisions concerning the purchase or lease of used accessible vehicles.

There is an exception to these requirements for donated vehicles. Not all "zero dollar" transfers are donations, however. The legislative history to this provision provides insight.

It is not the Committee's intent to make the vehicle accessibility provisions of this title applicable to vehicles donated to a public entity. The Committee understands that it is not usual to donate vehicles to a public entity. However, there could be instances where someone could conceivably donate a bus to a public transit operator in a will. In such a case, the transit operators should not be prevented from accepting a gift.

The Committee does not intend that this limited exemption for donated vehicles be used to circumvent the intent of the ADA. For example, a local transit authority could not arrange to be the recipient of donated inaccessible buses. This would be a violation of the ADA. S. Rpt. 101-116, at 46; H. Rpt. 101-466, at 87.

Entities interested in accepting donated vehicles must submit a request to UMTA to verify that the transaction is a donation.

There is one situation, in which a vehicle has prior use is not treated as a used vehicle. If a vehicle has been remanufactured, and it is within the period of the extension of its useful life, it is not viewed as a used vehicle (see H. Rept. 101-465, Pt 1 at 27). During this period, such a vehicle may be acquired by another entity without going through the good faith efforts process. This is because, at the time of its remanufacture, the bus would have been made as accessible if feasible. When the vehicle has completed its extended useful life (e.g., the beginning of year six when its useful life has extended five years), it becomes subject to used bus requirements.

#### *Section 37.75 Remanufacture of Non-Rail Vehicles and Purchase or Lease of Remanufactured Non-rail Vehicles by Public Entities Operating Fixed Route Systems*

This section tracks the statute closely, and contains the following provisions. First, it requires any public entity operating a fixed route system to purchase an accessible vehicle if the acquisition occurs after August 25, 1990, if the vehicle is remanufactured after August 25, 1990, or the entity contracts or undertakes the remanufacture of a vehicle after August 25, 1990. The ADA legislative history makes it clear that remanufacture is to include changes to the structure of the vehicle which extend the useful life of the vehicle for five years. It clearly is not intended to capture things such as engine overhauls and the like.

The term remanufacture, as used in the ADA context, is different from the use of the term in previously issued UMTA guidance. The term has a specific meaning under the ADA: there must be structural work done to the vehicle and the work must extend the vehicle's useful life by five years.

The ADA imposes no requirements on what UMTA traditionally considers bus rehabilitation. Such work involves rebuilding a bus to original specifications and focuses on mechanical systems and interiors. Often this work includes replacing components. It is less extensive than remanufacture.

The statute, and the rule, includes an exception for the remanufacture of historical vehicles. This exception applies to the remanufacture of or purchase of a remanufactured vehicle that (1) is of historic character; (2) operates solely on a segment of a fixed route system which is on the National Register of Historic Places; and (3) making the vehicle accessible would significantly alter the historic character of the vehicle. The exception only extends to the remanufacture that would alter the historic character of the vehicle. All modifications that can be made without altering the historic character (such as slip resistant flooring) must be done.

#### *Section 37.77 Purchase or Lease of New Non-Rail Vehicles by Public Entities Operating a Demand Responsive System for the General Public*

Section 224 of the ADA requires that a public entity operating a demand responsive system purchase or lease accessible new vehicles, for which a solicitation is made after August 25, 1990, unless the system, when viewed in its entirety, provides a level of service to individuals with disabilities, including individuals who use wheelchairs, equivalent to the level of service provided to individuals without disabilities. This section is the same as the October 4, 1990 final rule which promulgated the immediately effective acquisition requirements of the ADA.

The Department has been asked to clarify what "accessible when viewed in its entirety" means in the context of a demand responsive system being allowed to purchase an inaccessible vehicle. First, it is important to note that this exception applies only to demand responsive systems (and not fixed route systems). The term "equivalent service" was discussed during the passage of the

ADA. Material from the legislative history indicates that "when viewed in its entirety/ equivalent service" means that "when all aspects of a transportation system are analyzed, equal opportunities for each individual with a disability to use the transportation system must exist. (H. Rept. 101-184, Pt. 2, at 95; S. Rept. 101-116 at 54). For example, both reports said that "the time delay between a phone call to access the demand responsive system and pick up the individual is not greater because the individual needs a lift or ramp or other accommodation to access the vehicle." (*Id.*)

Consistent with this, the Department has specified certain service criteria that are to be used when determining if the service is equivalent. As in previous rulemakings on this provision, the standards (which include service area, response time, fares, hours and days of service, trip purpose restrictions, information and reservations capability, and other capacity constraints) are not absolute standards. They do not say, for example, that a person with a disability must be picked up in a specified number of hours. The requirement is that there must be equivalent service for all passengers, whether or not they have a disability. If the system provides service to persons without disabilities within four hours of a call for service, then passengers with disabilities must be afforded the same service.

The Department has been asked specifically where an entity should send its "equivalent level of service" certifications. We provide the following: Equivalent level of service certifications should be submitted to the state program office if you are a public entity receiving UMTA funds through the state. All other entities should submit their equivalent level of service certifications to the UMTA regional office (listed in appendix B of this part). Certifications must be submitted before the acquisition of the vehicles.

Paragraph (e) of this section authorizes a waiver for the unavailability of lifts. Since demand responsive systems need not purchase accessible vehicles if they can certify equivalent service, the Department has been asked what this provision is doing in this section.

Paragraph (e) applies in the case in which an entity operates a demand responsive system, which is not equivalent, and the entity cannot find accessible vehicles to acquire. In this case, the waiver provisions applicable to a fixed route entity purchasing or leasing inaccessible new vehicles applies to the demand responsive operator as well.

**Section 37.79 Purchase or Lease of New Rail Vehicles by Public Entities Operating Rapid or Light Rail Systems**

This section echoes the requirement of § 37.71—all new rail cars must be accessible.

**Section 37.81 Purchase or Lease of Used Rail Vehicles by Public Entities Operating Rapid or Light Rail Systems**

This section lays out the requirements for a public entity acquiring a used rail vehicle. The requirements and standards are the same as those specified for non-rail vehicles in § 37.73. While we recognize it may create

difficulties for entities in some situations, the statute does not include any extension or short-term leases. The Department will consider, in a case-by-case basis, how the good faith efforts requirement would apply in the case of an agreement between rail carriers to permit quick-response, short-term leases of cars over a period of time.

**Section 37.83 Remanufacture of Rail Vehicles and Purchase or Lease of Remanufactured Rail Vehicles by Public Entities Operating Rapid or Light Rail System**

This section parallels the remanufacturing section for buses, including the exception for historical vehicles. With respect to an entity having a class of historic vehicles that may meet the standards for the historic vehicle exception (e.g., San Francisco cable cars), the Department would not object to a request for application of the exception on a system-wide, as approved to car-by-car, basis.

**Section 37.85 Purchase or Lease of New Intercity and Commuter Rail Cars**

This section incorporates the statutory requirement that new intercity and commuter rail cars be accessible. The specific accessibility provisions of the statute (for example, there are slightly different requirements for intercity rail cars versus commuter rail cars) are specified in part 38 of this regulation. These standards are adopted from the voluntary guidelines issued by the Access Board. The section basically parallels the acquisition requirements for buses and other vehicles. It should be noted that the definition of commuter rail operator clearly allows for additional operators to qualify as commuter, since the definition describes the functional characteristics of an operator, as well as listing existing commuter rail operators.

We would point out that the ADA applies this requirement to all new vehicles. This includes not only vehicles and systems that currently are being operated in the U.S., but new, experimental, or imported vehicles and systems. The ADA does not stand in the way of new technology, but it does require that new technology, and the benefits it brings, be accessible to all persons, including those with disabilities. This point applies to all vehicle acquisition provisions of this regulation, whether for rail or non-rail, private or public, fixed route or demand responsive vehicles and systems.

**Section 37.87 Purchase or Lease of Used Intercity and Commuter Rail Cars**

The section also parallels closely the requirements in the ADA for the purchase or lease of accessible used rail vehicles. We acknowledge that, in some situations, the statutory requirement for to make good faith efforts to acquire accessible used vehicles may create difficulties for rail operators attempting to lease rail cars quickly for a short time (e.g., as fill-ins for cars which need repairs). In some cases, it may be possible to mitigate these difficulties through means such as making good faith efforts with respect to an overall agreement between two rail operators to make cars available to one another when needed, rather than each time a car is provided under such an agreement.

**Section 37.89 Remanufacture of Intercity and Commuter Rail Cars**

This section requires generally that remanufactured cars be made accessible, to the maximum extent feasible. Feasible is defined in paragraph (c) of the section to be "unless an engineering analysis demonstrates that remanufacturing the car to be accessible would have a significant adverse effect on the structural integrity of the car." Increased cost is not a reason for viewing other sections of this subpart concerning remanufactured vehicles.

In addition, this section differs from the counterpart sections for non-rail vehicles and light and rapid rail vehicles in two ways. First, the extension of useful life needed to trigger the section is ten rather than five years. Second, there is no historic vehicle exception. Both of these differences are statutory.

Remanufacture of vehicles implies work that extends their expected useful life of the vehicle. A mid-life overhaul, not extending the total useful life of the vehicle, would not be viewed as a remanufacture of the vehicle.

**Section 37.93—One Car Per Train Rule**

This section implements the statutory directive that all rail operators (light, rapid, commuter and intercity) have at least one car per train accessible to persons with disabilities, including individuals who use wheelchairs by July 26, 1995. (See ADA sections 242(a)(1), 242(b)(1), 228(b)(1)). Section 37.93 contains this general requirement. In some cases, entities will meet the one-car-per train rule through the purchase of new cars. In this case, since all new rail vehicles have to be accessible, compliance with this provision is straightforward.

However, certain entities may not be purchasing any new vehicles by July 26, 1995, or may not be purchasing enough vehicles to ensure that one car per train is accessible. In these cases, these entities will have to retrofit existing cars to meet this requirement. What a retrofitted car must look like to meet the requirement has been decided by the Access Board. These standards are contained in part 38 of this rule.

We would point out that, consistent with the Access Board standards, a rail system using mini-high platforms or wayside lifts is not required, in most circumstances, to "double-stop" in order to give passengers a chance to board the second or subsequent car in a train at the mini-high platform or way-side lift. The only exception to this would be a situation in which all the wheelchair positions spaces in the first car were occupied. In this case, the train would have to double-stop to allow a wheelchair user to board, rather than passing the person by when there was space available in other than the first car.

**Section 37.95 Ferries and Other Passenger Vessels**

Although at this time there are no specific requirements for vessels, ferries and other passenger vessels operated by public entities are subject to the requirements of § 37.5 of this part and applicable requirements of 28

CFR part 35, the DOJ rule under title II of the ADA.

#### Subpart E—Acquisition of Accessible Vehicles by Private Entities

*Section 37.101 Purchase or Lease of Non-Rail Vehicles by Private Entities Not Primarily Engaged in the Business of Transporting People*

*Section 37.103 Purchase or Lease of New Non-Rail Vehicles by Private Entities Primarily Engaged in the Business of Transporting People*

*Section 37.105 Equivalent Service Standard*

The first two sections spell out the distinctions among the different types of service elaborated in the ADA and requirements that apply to them. For clarity, we provide the following chart.

#### PRIVATE ENTITIES "NOT PRIMARILY ENGAGED"

System type	Vehicle capacity	Requirement
Fixed Route	Over 16	Acquire accessible vehicle.
Fixed Route	16 or less	Acquire accessible vehicle, or equivalency.
Demand Responsive.	Over 16	Acquire accessible vehicle, or equivalency
Demand Responsive.	16 or less	Equivalency—see § 37.171.

#### PRIVATE ENTITIES "PRIMARILY ENGAGED"

System type	Vehicle type/capacity	Requirement
Fixed route	All new vehicles except auto, van with less than 8 capacity, or over the road bus.	Acquire accessible vehicle.
Demand responsive.	Same as above.	Acquire accessible vehicle, or equivalency
Either fixed route or demand responsive.	New vans with a capacity of less than 8.	Same as above.

Equivalency, for purposes of these requirements, is spelled out in § 37.105. It is important to note that some portions of this section (referring to response time, reservations capacity, and restrictions on trip purpose) apply only to demand responsive systems. Another provision (schedules/headways) applies only to fixed route systems. This is because these points of comparison apply only to one or the other type system. The remaining provisions apply to both kinds of systems.

In applying the provisions this section, it is important to note that they are only points of

comparison, not substantive criteria. For example, unlike the response time criterion of § 37.131, this section does not require that a system provide any particular response time. All it says is that, in order for there to be equivalency, if the demand responsive system gets a van to a non-disabled person in 2 hours, or 8 hours, or a week and a half after a call for service, the system must get an accessible van to a person with a disability in 2 hours, or 8 hours, or a week and a half.

The vehicle acquisition and equivalency provisions work together in the following way. A private entity is about to acquire a vehicle for a transportation service in one of the categories to which equivalency is relevant. The entity looks at its present service (considered without regard to the vehicle it plans to acquire). Does the present service meet the equivalency standard? (In answering this question, the point of reference is the next potential customer who needs an accessible vehicle. The fact that such persons have not called in the past is irrelevant.) If not, the entity is required to acquire an accessible vehicle. If so, the entity may acquire an accessible or an inaccessible vehicle. This process must be followed every time the entity purchases or leases a vehicle. Given changes in the mixes of both customers and vehicles, the answer to the question about equivalency will probably not be the same for an entity every time it is asked.

One difference between the requirements for "private, not primarily" and "private, primarily" entities is that the requirements apply to all vehicles purchased or leased for the former, but only to new vehicles for the latter. This means that entities in the latter category are not required to acquire accessible vehicles when they purchase or lease used vehicles. Another oddity in the statute which entities should note is that the requirement for "private, primarily" entities to acquire accessible vans with less than eight passenger capacity (or provide equivalent service) does not become effective until after February 25, 1992 (This also date also applies to private entities "primarily engaged" which purchase passenger rail cars). All other vehicle acquisition requirements became effective after August 25, 1990.

The Department views the line between "private, primarily" and "private, not primarily" entities as being drawn with respect to the bus, van, or other service which the entity is providing. For example, there is an obvious sense in which an airline or car rental company is primarily engaged in the business of transporting people. If the airline or car rental agency runs a shuttle bus from the airport terminal to a downtown location or a rental car lot, however, the Department views that shuttle service as covered by the "private, not primarily" requirements of the rule (see discussion of the Applicability sections above). This is because the airline or car rental agency is not primarily engaged in the business of providing transportation by bus or van. The relationship of the bus or van service to an airline's main business is analogous to that of a shuttle to a hotel. For this purpose, it is of only incidental interest that the main business of the airline is flying people around

the country instead of putting them up for the night.

#### Section 37.109 Ferries and Other Passenger Vessels

Although at this time there are no specific requirements for vessels, ferries and other passenger vessels operated by private entities are subject to the requirements of § 37.5 of this part and applicable requirements of 28 CFR part 36, the DOJ rule under title III of the ADA.

#### Subpart F—Paratransit as a Complement to Fixed Route Service

##### Section 37.121 Requirement for Comparable Complementary Paratransit Service

This section sets forth the basic requirement that all public entities who operate a fixed route system have to provide paratransit service that is both comparable and complementary to the fixed route service. By "complementary," we mean service that acts as a "safety net" for individuals with disabilities who cannot use the fixed route system. By "comparable," we mean service that meets the service criteria of this subpart.

This requirement applies to light and rapid rail systems as well as to bus systems, even when rail and bus systems share all or part of the same service area. Commuter bus, commuter rail and intercity rail systems do not have to provide paratransit, however. The remaining provisions of subpart F set forth the details of the eligibility requirements for paratransit, the service criteria that paratransit systems must meet, the planning process involved, and the procedures for applying for waivers based on undue financial burden.

Paratransit may be provided by a variety of modes. Publicly operated dial-a-ride vans, service contracted out to a private paratransit provider, user-side subsidy programs, or any combination of these and other approaches is acceptable. Entities who feel it necessary to apply for an undue financial burden waiver should be aware that one of the factors UMTA will examine in evaluating waiver requests is efficiencies the provider could realize in its paratransit service. Therefore, it is important for entities in this situation to use the most economical and efficient methods of providing paratransit they can devise.

It is also important for them to establish and consistently implement strong controls against fraud, waste and abuse in the paratransit system. Fraud, waste and abuse can drain significant resources from a system and control of these problems is an important "efficiency for any paratransit system. It will be difficult for the Department to grant an undue financial burden waiver to entities which do not have a good means of determining if fraud, waste and abuse are problems and adequate methods of combating these problems, where they are found to exist.

##### Section 37.123 ADA Paratransit Eligibility—Standards

##### General Provisions

This section sets forth the minimum requirements for eligibility for



complementary paratransit service. All fixed route operators providing complementary paratransit must make service available at least to individuals meeting these standards. The ADA does not prohibit providing paratransit service to anyone. Entities may provide service to additional persons as well. Since only service to ADA eligible persons is required by the rule, however, only the costs of this service can be counted in the context of a request for an undue financial burden waiver.

When the rule says that ADA paratransit eligibility shall be strictly limited to persons in the eligible categories, then, it is not saying that entities are in any way precluded from serving other people. It is saying that the persons who must be provided service, and counting the costs of providing them service, in context of an undue burden waiver, are limited to the regulatory categories.

#### Temporary Disabilities

Eligibility may be based on a temporary as well as a permanent disability. The individual must meet one of the three eligibility criteria in any case, but can do so for a limited period of time. For example, if an individual breaks both legs and is in two casts for several weeks, becomes a wheelchair user for the duration, and the bus route that would normally take him to work is not accessible, the individual could be eligible under the second eligibility category. In granting eligibility to such a person, the entity should establish an expiration date for eligibility consistent with the expected end of the period disability.

#### Trip-by-Trip Eligibility

A person may be ADA paratransit eligible for some trips but not others. Eligibility does not inhere in the individual or his or her disability, as such, but in meeting the functional criteria of inability to use the fixed route system established by the ADA. This inability is likely to change with differing circumstances.

For example, someone whose impairment-related condition is a severe sensitivity to temperatures below 20 degrees is not prevented from using fixed route transit when the temperature is 75 degrees. Someone whose impairment-related condition is an inability to maneuver a wheelchair through snow is not prevented from using fixed route transit when there is no snow on the ground. Someone with a cognitive disability may have learned to take the same bus route to a supported employment job every day. This individual is able to navigate the system for work purposes and therefore would not be eligible for paratransit for work trips. But the individual may be unable to get to other destinations on the bus system without getting lost, and would be eligible for paratransit for non-work trips. Someone who normally drives his own car to a rail system park and ride lot may have a specific impairment related condition preventing him from getting to the station when his car is in the shop. A person who can use accessible fixed route service can go to one destination on an accessible route; another destination would require the use of an inaccessible route. The individual would be eligible for the latter but not the former.

In many cases, though the person is eligible for some trips but not others, eligibility determinations would not have to be made literally on a trip-by-trip basis. It may often be possible to establish the conditions on eligibility as part of the initial eligibility determination process. Someone with a temperature sensitivity might be granted seasonal eligibility. Somebody who is able to navigate the system for work but not non-work trips could have this fact noted in his or her eligibility documentation. Likewise, someone with a variable condition (e.g., multiple sclerosis, HIV disease, need for kidney dialysis) could have their eligibility based on the underlying condition, with paratransit need for a particular trip dependent on self-assessment or a set of medical standards (e.g., trip within a certain amount of time after a dialysis session). On the other hand, persons in the second eligibility category (people who can use accessible fixed route service where it exists) would be given service on the basis of the particular route they would use for a given trip.

Because entities are not precluded from providing service beyond that required by the rule, an entity that believes it is too difficult to administer a program of trip-by-trip eligibility is not required to do so. Nothing prevents an entity from providing all requested trips to a person whom the ADA requires to receive service for only some trips. In this case, if the entity intends to request an undue financial burden waiver, the entity, as provided in the undue burden provisions of this rule, must estimate, by a statistically valid technique, the percentage of its paratransit trips that are mandated by the ADA. Only that percentage of its total costs will be counted in considering the undue burden waiver request.

#### Category 1 Eligibility

The first eligibility category includes, among others, persons with mental or visual impairments who, as a result, cannot "navigate the system." This eligibility category includes people who cannot board, ride, or disembark from an accessible vehicle "without the assistance of another individual." This means that, if an individual needs an attendant to board, ride, or disembark from an accessible fixed route vehicles (including "navigating the system"), the individual is eligible for paratransit. One implication of this language is that an individual does not lose paratransit eligibility based on "inability to navigate the system" because the individual chooses to travel with a friend on the paratransit system (even if the friend could help the person navigate the fixed route system). Eligibility in this category is based on ability to board, ride, and disembark independently.

Mobility training (e.g., of persons with mental or visual impairments) may help to improve the ability of persons to navigate the system or to get to a bus stop. Someone who is successfully mobility trained to use the fixed route system for all or some trips need not be provided paratransit service for those trips. The Department encourages entities to sponsor such training as a means of assisting individuals to use fixed route rather than paratransit.

#### Category 2 Eligibility

The second eligibility criterion is the broadest, with respect to persons with mobility impairments, but its impact should be reduced over time as transit systems become more accessible. This category applies to persons who could use accessible fixed route transportation, but accessible transportation is not being used at the time, and on the route, the persons would travel. This concept is route based, not system based.

Speaking first of bus systems, if a person is traveling from Point A to Point B on route 1, and route 1 is accessible, the person is not eligible for paratransit for the trip. This is true even though other portions of the system are still inaccessible. If the person is traveling from Point A to Point C on route 2, which is not accessible, the person is eligible for that trip. If the person is traveling from point A to Point B on accessible route 1, with a transfer at B to go on inaccessible route 3 to Point D, then the person is eligible for the second leg of the trip. (The entity could choose to provide a paratransit trip from A to D or a paratransit or on-call bus trip from B to D.)

For purposes of this standard, we view a route as accessible when all buses scheduled on the route are accessible. Otherwise, it is unlikely that an accessible vehicle could be provided "within a reasonable period of [a] time" when the individual wants to travel, as the provision requires. We recognize that some systems' operations may not be organized in a way that permits determining whether a given route is accessible, even though a route-by-route determination appears to be contemplated by the statute. In such cases, it may be that category 2 eligibility would persist until the entire system was eligible.

With respect to a rail system, an individual is eligible under this standard if, on the route or line he or she wants to use, there is not yet one car per train accessible or if key stations are not yet accessible. This eligibility remains even if bus systems covering the area served by the rail system have become 100 percent accessible. This is necessary because people use rail systems for different kinds of trips than bus systems. It would often take much more in the way of time, trouble, and transfers for a person to go on the buses of one or more transit authorities than to have a direct trip provided by the rail operator. Since bus route systems are often designed to feed rail systems rather than duplicate them, it may often be true that "you can't get there from here" relying entirely on bus routes or the paratransit service area that parallels them.

If the lift on a vehicle cannot be deployed at a particular stop, an individual is eligible for paratransit under this category with respect to the service to the inaccessible stop. If on otherwise accessible route 1, an individual wants to travel from Point A to Point E, and the lift cannot be deployed at E, the individual is eligible for paratransit for the trip. (On-call bus would not work as a mode of providing this trip, since a bus lift will not deploy at the stop.) This is true even though service from Point A to all other points on the line is fully accessible. In this

circumstance, the entity should probably think seriously about working with the local government involved to have the stop moved or made accessible.

When we say that a lift cannot be deployed, we mean literally that the mechanism will not work at the location to permit a wheelchair user or other person with a disability to disembark or that the lift will be damaged if it is used there. It is not consistent with the rule for a transit provider to declare a stop off-limits to someone who uses the lift while allowing other passengers to use the stop. However, if temporary conditions not under the operator's control (e.g., construction, an accident, a landslide) make it so hazardous for anyone to disembark that the stop is temporarily out of service for all passengers may the operator refuse to allow a passenger to disembark using the lift.

#### Category 3 Eligibility

The third eligibility criterion concerns individuals who have a specific impairment-related condition which prevents them from getting to or from a stop or station. As noted in the legislative history of the ADA, this is intended to be a "very narrow exception" to the general rule that difficulty in traveling to or from boarding or disembarking locations is not a basis for eligibility.

What is a specific impairment-related condition? The legislative history mentions four examples: Chronic fatigue, blindness, a lack of cognitive ability to remember and follow directions, or a special sensitivity to temperature. Impaired mobility, severe communications disabilities (e.g., a combination of serious vision and hearing impairments), cardiopulmonary conditions, or various other serious health problems may have similar effects. The Department does not believe that it is appropriate, or even possible, to create an exhaustive list.

What the rule uses as an eligibility criterion is not just the existence of a specific impairment-related condition. To be a basis for eligibility, the condition must prevent the individual from traveling to a boarding location or from a disembarking location. The word "prevent" is very important. For anyone, going to a bus stop and waiting for a bus is more difficult and less comfortable than waiting for a vehicle at one's home. This is likely to be all the more true for an individual with a disability. But for many persons with disabilities, in many circumstances, getting to a bus stop is possible. If an impairment related condition only makes the job of accessing transit more difficult than it might otherwise be, but does not prevent the travel, then the person is not eligible.

For example, in many areas, there are not yet curb cuts. A wheelchair user can often get around this problem by taking a less direct route to a destination than an ambulatory person would take. That involves more time, trouble, and effort than for someone without a mobility impairment. But the person can still get to the bus stop. On the basis of these architectural barriers, the person would not be eligible.

Entities are cautioned that, particularly in cases involving lack of curb cuts and other architectural barrier problems, assertions of

eligibility should be given tight scrutiny. Only if it is apparent from the facts of a particular case that an individual cannot find a reasonable alternative path to a location should eligibility be granted.

If we add a foot of snow to the scenario, then the same person taking the same route may be unable to get to the bus stop. If it is not the snow alone that stops him; it is the interaction of the snow and the fact that the individual has a specific-impairment related condition that requires him to push a wheelchair through the snow that prevents the travel.

Inevitably, some judgment is required to distinguish between situations in which travel is prevented and situations in which it is merely made more difficult. In the Department's view, a case of "prevented travel" can be made not only where travel is literally impossible (e.g., someone cannot find the bus stop, someone cannot push a wheelchair through the foot of snow or up a steep hill) but also where the difficulties are so substantial that a reasonable person with the impairment-related condition in question would be deterred from making the trip.

The regulation makes the interaction between an impairment-related condition and the environmental barrier (whether distance, weather, terrain, or architectural barriers) the key to eligibility determinations. This is an individual determination. Depending on the specifics of their impairment-related condition, one individual may be able to get from his home to a bus stop under a given set of conditions, while his next-door neighbor may not.

#### Companions

The ADA requires entities to provide paratransit to one person accompanying the eligible individual, with others served on a space-available basis. The one individual who is guaranteed space on the vehicle can be anyone—family member, business associate, friend, date, etc. The provider cannot limit the eligible individual's choice of type of companion. The transit authority may require that the eligible individual reserve a space for the companion when the individual reserves his or her own ride. This one individual rides even if this means that there is less room for other eligible individuals. Additional individuals beyond the first companion are carried only on a space available basis; that is, they do not displace other ADA paratransit eligible individuals.

A personal care attendant (i.e., someone designated or employed specifically to help the eligible individual meet his or her personal needs) always may ride with the eligible individual. If there is a personal care attendant on the trip, the eligible individual may still bring a companion, plus additional companions on a space available basis. The entity may require that, in reserving the trip, the eligible individual reserve the space for the attendant.

To prevent potential abuse of this provision, the rule provides that a companion (e.g., friend or family member) does not count as a personal care attendant unless the eligible individual regularly makes use of a personal care attendant and the companion is actually acting in that capacity. As noted under § 37.125, a provider may require that,

as part of the initial eligibility certification process, an individual indicate whether he or she travels with a personal care attendant. If someone does not indicate the use of an attendant, then any individual accompanying him or her would be regarded simply as a companion.

To be viewed as "accompanying" the eligible individual, a companion must have the same origin and destination points as the eligible individual. In appropriate circumstances, entities may also wish to provide service to a companion who has either an origin or destination, but not both, with the eligible individual (e.g., the individual's date is dropped off at her own residence on the return trip from a concert).

#### Section 37.125 ADA Paratransit Eligibility—Process

This section requires an eligibility process to be established by each operator of complementary paratransit. The details of the process are to be devised through the planning and public participation process of this subpart. The process may not impose unreasonable administrative burdens on applicants, and, since it is part of the entity's nondiscrimination obligations, may not involve "user fees" or application fees to the applicant.

The process may include functional criteria related to the substantive eligibility criteria of § 37.123 and, where appropriate, functional evaluation or testing of applicants. The substantive eligibility process is not aimed at making a medical or diagnostic determination. While evaluation by a physician (or professionals in rehabilitation or other relevant fields) may be used as part of the process, a diagnosis of a disability is not dispositive. What is needed is a determination of whether, as a practical matter, the individual can use fixed route transit in his or her own circumstances. That is a transportation decision primarily, not a medical decision.

The goal of the process is to ensure that only people who meet the regulatory criteria, strictly applied, are regarded as ADA paratransit eligible. The Department recognizes that transit entities may wish to provide service to other persons, which is not prohibited by this rule. However, the eligibility process should clearly distinguish those persons who are ADA eligible from those who are provided service on other grounds. For example, eligibility documentation must clearly state whether someone is ADA paratransit eligible or eligible on some other basis.

Often, people tend to think of paratransit exclusively in terms of people with mobility impairments. Under the ADA, this is not accurate. Persons with visual impairments may be eligible under either the first or third eligibility categories. To accommodate them, all documents concerning eligibility must be made available in one or more accessible formats, on request. Accessible formats include computer disks, braille documents, audio cassettes, and large print documents. A document does not necessarily need to be made available in the format a requester prefers, but it does have to be made available

in a format the person can use. There is no use giving a computer disk to someone who does not have a computer, for instance, or a braille document to a person who does not read braille.

When a person applies for eligibility, the entity will provide all the needed forms and instructions. These forms and instructions may include a declaration of whether the individual travels with a personal care attendant. The entity may make further inquiries concerning such a declaration (e.g., with respect to the individual's actual need for a personal care attendant).

When the application process is complete—all necessary actions by the applicant taken—the entity should process the application in 21 days. If it is unable to do so, it must begin to provide service to the applicant on the 22nd day, as if the application had been granted. Service may be terminated only if an when the entity denies the application. All determinations shall be in writing; in the case of a denial, reasons must be specified. The reasons must specifically relate the evidence in the matter to the eligibility criteria of this rule and of the entity's process. A mere recital that the applicant can use fixed route transit is not sufficient.

For people granted eligibility, the documentation of eligibility shall include at least the following information:

- The individual's name
- The name of the transit provider
- The telephone number of the entity's paratransit coordinator
- An expiration date for eligibility
- Any conditions or limitations on the individual's eligibility, including the use of a personal care attendant.

The last point refers to the situation in which a person is eligible for some trips but not others. Or if the traveler is authorized to have a personal care attendant ride free of charge. For example, the documentation may say that the individual is eligible only when the temperature falls below a certain point, or when the individual is going to a destination not on an accessible bus route, or for non-work trips, etc.

As the mention of an expiration date implies, certification is not forever. The entity may recertify eligibility at reasonable intervals to make sure that changed circumstances have not invalidated or changed the individual's eligibility. In the Department's view, a reasonable interval for recertification is probably between one and three years. Less than one year would probably be too burdensome for consumers; over three years would begin to lose the point of doing recertifications. The recertification interval should be stated in the entity's plan. Of course, a user of the service can apply to modify conditions on his or her eligibility at any time.

The administrative appeal process is intended to give applicants who have been denied eligibility the opportunity to have their cases heard by some official other than the one who turned them down in the first place. In order to have appropriate separation of functions—a key element of administrative due process—not only must the same person not decide the case on

appeal, but that person, to the extent practicable, should not have been involved in the first decision (e.g., as a member of the same office, or a supervisor or subordinate of the original decisionmaker). When, as in the case of a small transit operator, this degree of separation is not feasible, the second decisionmaker should at least be "bubbled" with respect to the original decision (i.e., not have participated in the original decision or discussed it with the original decisionmaker). In addition, there must be an opportunity to be heard in person as well as the chance to present written evidence and arguments. All appeals decisions must be in writing, stating the reasons for the decision.

To prevent the filing of stale claims, the entity may establish a 60 day "statute of limitations" on filing of appeals, the time starting to run on the date the individual is notified on the negative initial decision. After the appeals process has been completed (i.e., the hearing and/or written submission completed), the entity should make a decision within 30 days. If it does not, the individual must be provided service beginning the 31st day, until and unless an adverse decision is rendered on his or her appeal.

Under the eligibility criteria of the rule, an individual has a right to paratransit if he or she meets the eligibility criteria. As noted in the discussion of the nondiscrimination section, an entity may refuse service to individual with a disability who engages in violent, seriously disruptive, or illegal conduct, using the same standards for exclusion that would apply to any other person who acted in such an inappropriate way.

The rule also allows an entity to establish a process to suspend, for a reasonable period of time, the provision of paratransit service to an ADA eligible person who establishes a pattern or practice of missing scheduled trips. The purpose of this process would be to deter or deal with chronic "no-shows." The sanction system—articulated criteria for the imposition of sanctions, length of suspension periods, details of the administrative process, etc.—would be developed through the public planning and participation process for the entity's paratransit plan, and the result reflected in the plan submission to UMTA.

It is very important to note that sanctions could be imposed only for a "pattern or practice" of missed trips. A pattern or practice involves intentional, repeated or regular actions, not isolated, accidental, or singular incidents. Moreover, only actions within the control of the individual count as part of a pattern or practice. Missed trips due to operator error are not attributable to the individual passenger for this purpose. If the vehicle arrives substantially after the scheduled pickup time, and the passenger has given up on the vehicle and taken a taxi or gone down the street to talk to a neighbor, that is not a missed trip attributable to the passenger. If the vehicle does not arrive at all, or is sent to the wrong address, or to the wrong entrance to a building, that is not a missed trip attributable to the passenger. There may be other circumstances beyond the individual's control (e.g., a sudden turn for the worse in someone with a variable condition, a sudden family emergency) that

make it impracticable for the individual to travel at the scheduled time and also for the individual to notify the entity in time to cancel the trip before the vehicle comes. Such circumstances also would not form part of a sanctionable pattern or practice.

Once an entity has certified someone as eligible, the individual's eligibility takes on the coloration of a property right. (This is not merely a theoretical statement. If one depends on transportation one has been found eligible for to get to a job, and the eligibility is removed, one may lose the job. The same can be said for access to medical care or other important services.) Consequently, before eligibility may be removed "for cause" under this provision, the entity must provide administrative due process to the individual.

If the entity proposes to impose sanctions on someone, it must first notify the individual in writing (using accessible formats where necessary). The notice must specify the basis of the proposed action (e.g., Mr. Smith scheduled trips for 8 a.m. on May 15, 2 p.m. on June 3, 9 a.m. on June 21, and 9:20 p.m. on July 10, and on each occasion the vehicle appeared at the scheduled time and Mr. Smith was nowhere to be found) and set forth the proposed sanction (e.g., Mr. Smith would not receive service for 15 days).

The entity would provide the individual an opportunity to be heard (i.e., an in-person informal hearing before a decisionmaker) as well as to present written and oral information and arguments. All relevant entity records and personnel would be made available to the individual, and other persons could testify. It is likely that, in many cases, an important factual issue would be whether a missed trip was the responsibility of the provider or the passenger, and the testimony of other persons and the provider's records or personnel are likely to be relevant in deciding this issue. While the hearing is intended to be informal, the individual could bring a representative (e.g., someone from an advocacy organization, an attorney).

The individual may waive the hearing and proceed on the basis of written presentations. If the individual does not respond to the notice within a reasonable time, the entity may make, in effect, a default finding and impose sanctions. If there is a hearing, and the individual needs paratransit service to attend the hearing, the entity must provide it. We would emphasize that, prior to a finding against the individual after this due process procedure, the individual must continue to receive service. The entity cannot suspend service while the matter is pending.

The entity must notify the individual in writing about the decision, the reasons for it, and the sanctions imposed, if any. Again, this information would be made available in accessible formats. In the case of a decision adverse to the individual, the administrative appeals process of this section would apply. The sanction would be stayed pending an appeal.

There are means other than sanctions, however, by which a transit provider can deal with a "no-show" problem in its system. Providers who use "real time scheduling" report that this technique is very effective in



reducing no-shows and cancellations, and increasing the mix of real time scheduling in a system can probably be of benefit in this area. Calling the customer to reconfirm a reasonable time before pickup can head off some problems, as can educating consumers to call with cancellations ahead of time. Training of dispatch and operator personnel can help to avoid miscommunications that lead to missed trips.

#### *Section 37.127 Complementary Paratransit for Visitors*

This section requires each entity having a complementary paratransit system to provide service to visitors from out of town on the same basis as it is provided to local residents. By "on the same basis," we mean under all the same conditions, service criteria, etc., without distinction. For the period of a visit, the visitor is treated exactly like an eligible local user, without any higher priority being given to either.

A visitor is defined as someone who does not reside in the jurisdiction or jurisdictions served by the public entity or other public entities with which it coordinates paratransit service. For example, suppose a five-county metropolitan area provides coordinated paratransit service under a joint plan. A resident of any of the five counties would not be regarded as a visitor in any of them. Note that the rule talks in terms of "jurisdiction" rather than "service area." If an individual lives in XYZ County, but outside the fixed route service area of that county's transit provider, the individual is still not a visitor for purposes of paratransit in PQR County, if PQR is one of the counties with which XYZ provides coordinated paratransit service.

A visitor can become eligible in one of two ways. The first is to present documentation from his or her "home" jurisdiction's paratransit system. The local provider will give "full faith and credit" to the ID card or other documentation from the other entity. If the individual has no such documentation, the local provider may require the provision of proof of visitor status (i.e., proof of

residence somewhere else) and, if the individual's disability is not apparent, proof of the disability (e.g., a letter from a doctor or rehabilitation professional). Once this documentation is presented and is satisfactory, the local provider will make service available on the basis of the individual's statement that he or she is unable to use the fixed route transit system.

The local provider need serve someone based on visitor eligibility for no more than 21 days. After that, the individual is treated the same as a local person for eligibility purposes. This is true whether the 21 days are consecutive or parceled out over several shorter visits. The local provider may require the erstwhile visitor to apply for eligibility in the usual local manner. A visitor who expects to be around longer than 21 days should apply for regular eligibility as soon as he arrives. The same approach may be used for a service of requested visits totaling 21 days or more in a relating compact period of time. Preferably, this application process should be arranged before the visitor arrives, by letter, telephone or fax, so that a complete application can be processed expeditiously.

#### *Section 37.129 Types of Service*

The basic mode of service for complementary paratransit is demand responsive, origin-to-destination service. This service may be provided for persons in any one of the three eligibility categories, and must always be provided to persons in the first category (e.g., people who cannot navigate the system). The local planning process should decide whether, or in what circumstances, this service is to be provided as door-to-door or curb-to-curb service.

For persons in the second eligibility category (e.g., persons who can use accessible buses, but do not have an accessible bus route available to take them to their destination), origin-to-destination service can be used. Alternatively, the entity can provide either of two other forms of service. One is on-call bus, in which the individual calls the provider and arranges for

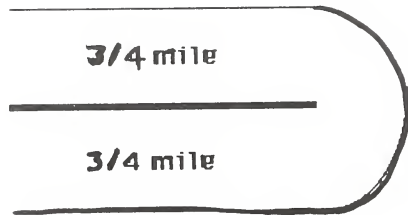
one or more accessible buses to arrive on the routes he needs to use at the appropriate time. On-call bus service must meet all the service criteria of § 37.131, except that on-call buses run only on fixed routes and the fare charged can be only the fixed route fare that anyone pays on the bus (including discounts).

The second option is "feeder paratransit" to an accessible fixed route that will take the individual to his or her destination. Feeder paratransit, again, would have to meet all the criteria of § 37.131. With respect to fares, the paratransit fare could be charged, but the individual would not be double charged for the trip. That is, having paid the paratransit fare, the transfer to the fixed route would be free.

For persons in the third eligibility category (e.g., persons who can use fixed route transit but who, because of a specific impairment-related condition, cannot get to or from a stop), the "feeder paratransit" option, under the conditions outlined above, is available. For some trips, it might be necessary to arrange for feeder service at both ends of the fixed route trip. Given the more complicated logistics of such arrangements, and the potential for a mistake that would seriously inconvenience the passenger, the transit provider should consider carefully whether such a "double feeder" system, while permissible, is truly workable in its system (as opposed to a simpler system that used feeder service only at one end of a trip when the bus let the person off at a place from which he or she could independently get to the destination). There may be some situations in which origin to destination service is easier and less expensive.

#### *Section 37.131 Service Criteria for Complementary Paratransit Service Area*

The basic bus system service area is a corridor with a width of  $\frac{3}{4}$  of a mile on each side of each fixed route. At the end of a route, there is a semicircular "cap" on the corridor, consisting of a three-quarter mile radius from the end point of the route to the parallel sides of the corridor.



Complementary paratransit must provide service to any origin or destination point within a corridor fitting this description around any route in the bus system. Note that this does not say that an eligible user must live within a corridor in order to be eligible. If an individual lives outside the corridor, and

can find a way of getting to a pickup point within the corridor, the service must pick him up there. The same holds true at the destination end of the trip.

Another concept involved in this service criterion is the core service area. Imagine a bus route map of a typical city. Color the bus

routes and their corridors blue, against the white outline map. In the densely populated areas of the city, the routes (which, with their corridors attached, cut  $\frac{1}{2}$  mile swaths) merge together into a solid blue mass. There are few, if any, white spots left uncovered, and they are likely to be very small.

Paratransit would serve all origins and destinations in the solid blue mass.

But what of the little white spots surrounded by various bus corridors? Because it would make sense to avoid providing service to such small isolated areas, the rule requires paratransit service there as well. So color them in too.

Outside the core area, though, as bus routes follow radial arteries into the suburbs and exurbs (we know real bus route maps are more complicated than this, but we simplify for purposes of illustration), there are increasingly wide white areas between the blue corridors, which may have corridors on either side of them but are not small areas completely surrounded by corridors. These white spaces are not part of the paratransit service area and the entity does not have to

serve origins and destinations there.

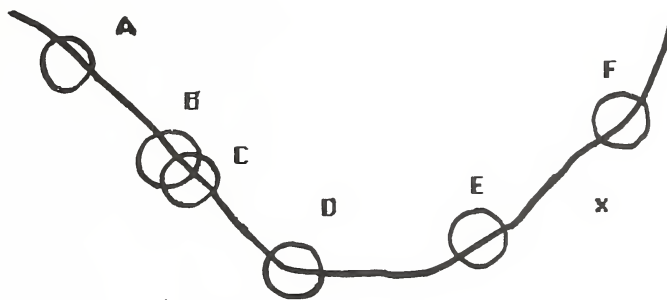
However, if, through the planning process, the entity wants to enlarge the width of one or more of the blue corridors from the  $\frac{3}{4}$  of a mile width, it can do so, to a maximum of  $1\frac{1}{2}$  miles on each side of a route. The cost of service provided within such an expanded corridor can be counted in connection with an undue financial burden waiver request.

There may be a part of the service area where part of one of the corridors overlaps a political boundary, resulting in a requirement to serve origins and destinations in a neighboring jurisdiction which the entity lacks legal authority to service. The entity is not required to serve such origins and destinations, even though the area on the other side of the political boundary is within a corridor. This exception to the service area

criterion does not automatically apply whenever there is a political boundary, only when there is a legal bar to the entity providing service on the other side of the boundary.

The rule requires, in this situation, that the entity take all practicable steps to get around the problem so that it can provide service throughout its service area. The entity should work with the state or local governments involved, via coordination plans, reciprocity agreements, memoranda or understanding or other means to prevent political boundaries from becoming barriers to the travel of individuals with disabilities.

The definition of the service area for rail systems is somewhat different, though many of the same concepts apply.



Circle radius =  $\frac{3}{4}$  mile

Around each station on the line (whether or not a key station), the entity would draw a circle with a radius of  $\frac{3}{4}$  mile. Some circles may touch or overlap. The series of circles is the rail system's service area. (We recognize that, in systems where stations are close together, this could result in a service area that approached being a corridor like that of a bus line.) The rail system would provide paratransit service from any point in one circle to any point in any other circle. The entity would not have to provide service to two points within the same circle, since a trip between two points in the vicinity of the same station is not a trip that typically would be taken by train. Nor would the entity have to provide service to spaces between the circles. For example, a train trip would not get close to point X; one would have to take a bus or other mode of transportation to get from station E or F to point X. A paratransit system comparable to the rail service area would not be required to take someone there either.

Rail systems typically provide trips that are not made, or cannot be made conveniently, on bus systems. For example, many rail systems cross jurisdictional boundaries that bus systems often do not. One can travel

from Station A to a relatively distant Station E on a rail system in a single trip, while a bus trip between the same points, if possible at all, may involve a number of indirect routings and transfers, on two bus systems that may not interface especially well.

Rail operators have an obligation to provide paratransit equivalents of trips between circles to persons who cannot use fixed route rail systems because they cannot navigate the system, because key stations or trains are not yet accessible, or because they cannot access stations from points within the circles because of a specific impairment-related condition. For individuals who are eligible in category 2 because they need an accessible key station to use the system, the paratransit obligation extends only to transportation among "circles" centered on designated key stations (since, even when the key station plan is fully implemented, these individuals will be unable to use non-key stations).

It is not sufficient for a rail operator to refer persons with disabilities to an accessible bus system in the area. The obligation to provide paratransit for a rail system is independent of the operations of any bus system serving the same area,

whether operated by the same entity that operates the rail system or a different entity. Obviously, it will be advantageous for bus and rail systems to coordinate their paratransit efforts, but a coordinated system would have to ensure coverage of trips comparable to rail trips that could not conveniently be taken on the fixed route bus system.

#### Response Time

Under this provision, an entity must make its reservation service available during the hours its administrative offices are open. If those offices are open 9 to 5, those are the hours during which the reservations service must be open, even if the entity's transit service operated 6 a.m. to midnight. On days prior to a service day on which the administrative offices are not open at all (e.g., a Sunday prior to a Monday service day), the reservation service would also be open 9 to 5. Note that the reservation service on any day does not have to be provided directly by a "real person." An answering machine or other technology can suffice.

Any caller reaching the reservation service during the 9 to 5 period, in this example,



could reserve service for any time during the next 6 a.m. to 12 midnight service day. This is the difference between "next day scheduling" and a system involving a 24-hour prior reservation requirement, in which a caller would have to reserve a trip at 7 a.m. today if he or she wanted to travel at 7 a.m. tomorrow. The latter approach is not adequate under this rule.

The entity may use real time scheduling for all or part of its service. Like the Moliere character who spoke prose all his life without knowing it, many entities may already be using some real time scheduling (e.g., for return trips which are scheduled on a when-needed basis, as opposed to in advance). A number of transit providers who have used real time scheduling believe that it is more efficient on a per-trip basis and reduces cancellations and no-shows significantly. We encourage entities to consider this form of service.

Sometimes users want to schedule service well in advance, to be sure of traveling when they want to. The rule tells providers to permit reservations to be made as much as 14 days in advance. In addition, though an entity may negotiate with a user to adjust pickup and return trip times to make scheduling more efficient, the entity cannot insist on scheduling a trip more than one hour earlier or later than the individual desires to travel. Any greater deviation from desired trip would exceed the bounds of comparability.

#### Fares

To calculate the proper paratransit fare, the entity would determine the route(s) that an individual would take to get from his or her origin to his or her destination on the fixed route system. At the time of day the person was traveling, what is the fare for that trip on those routes? Applicable charges like transfer fees or premium service charges may be added to the amount, but discounts (e.g., the half-fare discount for off-peak fixed route travel by elderly and handicapped persons) would not be subtracted. The transit provider could charge up to twice the resulting amount for the paratransit trip.

The mode through which paratransit is provided does not change the method of calculation. For example, if paratransit is provided via user side subsidy taxi service rather than publicly operated dial-a-ride van service, the cost to the user could still be only twice the applicable fixed route fare. The system operates the same regardless of whether the paratransit trip is being provided in place of a bus or a rail trip the user cannot make on the fixed route system. Where bus and rail systems are run by the same provider (or where the same bus provider runs parallel local and express buses along the same route), the comparison would be made to the mode on which a typical fixed route user would make the particular trip, based on schedule, length, convenience, avoidance of transfers, etc.

Companions are charged the same fare as the eligible individual they are accompanying. Personal care attendants ride free.

One exception to the fare requirement is made for social service agency (or other organization-sponsored) trips. This exception, which allows the transit provider to negotiate

a price with the agency that is more than twice the relevant fixed route fare, applies to "agency trips," by which we mean trips which are guaranteed to the agency for its use. That is, if an agency wants 12 slots for a trip to the mall on Saturday for clients with disabilities, the agency makes the reservation for the trips in its name, the agency will be paying for the transportation, and the trips are reserved to the agency, for whichever 12 people the agency designates, the provider may then negotiate any price it can with the agency for the trips. We distinguish this situation from one in which an agency employee, as a service, calls and makes an individual reservation in the name of a client, where the client will be paying for the transportation.

#### Restrictions and Priorities Based on Trip Purpose

This is a simple and straightforward requirement. There can be no restrictions or priorities based on trip purpose in a comparable complementary paratransit system. When a user reserves a trip, the entity will need to know the origin, destination, time of travel, and how many people are traveling. The entity does not need to know why the person is traveling, and should not even ask.

#### Hours and Days of Service

This criterion says simply that if a person can travel to a given destination using a given fixed route at a given time of day, an ADA paratransit eligible person must be able to travel to that same destination on paratransit at that time of day. This criterion recognizes that the shape of the service area can change. Late at night, for example, it is common for certain routes not to be run. Those routes, and their paratransit corridors, do not need to be served with paratransit when the fixed route system is not running on them. One couldn't get to destinations in that corridor by fixed route at those times, so paratransit service is not necessary either.

It should be pointed out that service during low-demand times need not be by the same paratransit mode as during higher usage periods. For example, if a provider uses its own paratransit vans during high demand periods, it could use a private contractor or user-side subsidy provider during low demand periods. This would presumably be a more efficient way of providing late night service. A call-forwarding device for communication with the auxiliary carrier during these low demand times would be perfectly acceptable, and could reduce administrative costs.

#### Capacity Constraints

This provision specifically prohibits two common mechanisms that limit use of a paratransit system so as to constrain demand on its capacity. The first is a waiting list. Typically, a waiting list involves a determination by a provider that it can provide service only to a given number of eligible persons. Other eligible persons are not able to receive service until one of the people being served moves away or otherwise no longer uses the service. Then the persons on the waiting list can move up. The process is analogous to the wait that

persons in some cities have to endure to be able to buy season tickets to a sold-out slate of professional football games.

The second mechanism specifically mentioned is a number limit on the trips a passenger can take in a given period of time. It is a kind of rationing in which, for example, if one has taken his quota of 30 trips this month, he cannot take further trips for the rest of the month.

In addition, this paragraph prohibits any operational pattern or practice that significantly limits the availability of service of ADA paratransit eligible persons. As discussed under § 37.125 in the context of missed trips by passengers, a "pattern or practice" involves, regular, or repeated actions, not isolated, accidental, or singular incidents. A missed trip, late arrival, or trip denial now and then does not trigger this provision.

Operational problems outside the control of the entity do not count as part of a pattern or practice under this provision. For example, if the vehicle has an accident on the way to pick up a passenger, the late arrival would not count as part of a pattern or practice. If something that could not have been anticipated at the time the trip was scheduled (e.g., a snowstorm, an accident or hazardous materials incident that traps the paratransit vehicle, like all traffic on a certain highway, for hours), the resulting missed trip would not count as part of a pattern or practice. On the other hand, if the entity regularly does not maintain its vehicles well, such that frequent mechanical breakdowns result in missed trips or late arrivals, a pattern or practice may exist. This is also true in a situation in which scheduling practices fail to take into account regularly occurring traffic conditions (e.g., rush hour traffic jams), resulting in frequent late arrivals.

The rule mentions three specific examples of operational patterns or practices that would violate this provision. The first is a pattern or practice of substantial numbers of significantly untimely pickups (either for initial or return trips). To violate this provision, there must be both a substantial number of late arrivals and the late arrivals in question must be significant in length. For example, a DOT Inspector General's (IG) report on one city's paratransit system disclosed that around 30 percent of trips were between one and five hours late. Such a situation would trigger this provision. On the other hand, only a few instances of trips one to five hours late, or many instances of trips a few minutes late, would not trigger this provision.

The second example is substantial numbers of trip denials or missed trips. For example, if on a regular basis the reservation phone lines open at 5 a.m. and callers after 7 a.m. are all told that they cannot travel, or the phone lines shut down after 7 a.m. and a recorded message says to call back the next day, or the phone lines are always so busy that no one can get through, this provision would be triggered. (Practices of this kind would probably violate the response time criterion as well.) Also, if, on a regular basis, the entity misses a substantial number of trips (e.g., a trip is scheduled, the passenger is

waiting, but the vehicle never comes, goes to the wrong address, is extremely late, etc.), it would violate this provision.

The third example is substantial numbers of trips with excessive trip lengths. Since paratransit is a shared ride service, a paratransit ride between Point A and Point B will usually take longer, and involve more intermediate stops, than a taxi ride between the same two points. However, when the number of intermediate stops and the total trip time for a given passenger grows so large as to make use of the system prohibitively inconvenient, then this provision would be triggered. For example, the IG report referred to above mentioned a situation in which 9 percent of riders had one way trips averaging between two and four hours, with an average of 16 intermediate stops. Such a situation would probably trigger this provision.

Though these three examples probably cover the most frequently cited problems in paratransit operations that directly or indirectly limit the provision of service that is theoretically available to eligible persons, the list is not exhaustive. Other patterns or practices could trigger this provision. For example, the Department has heard about a situation in which an entity's paratransit contractor was paid on a per-trip basis, regardless of the length of the trip. The contractor therefore had an economic incentive to provide as many trips as possible. As a result, the contractor accepted short trips and routinely denied longer trips. This would be a pattern or practice contrary to this provision (and contrary to the service area provision as well).

#### Additional Service

This provision emphasizes that entities may go beyond the requirements of this section in providing service to ADA paratransit individuals. For example, no one is precluded from offering service in a larger service area, during greater hours than the fixed route system, or without charge. However, costs of such additional service do not count with respect to undue financial burden waiver requests. Where a service criterion itself incorporates a range of actions the entity may take (e.g., providing wide corridors outside the urban core, using real time scheduling), however, costs of providing that optional service may be counted for undue financial burden waiver request purposes.

#### Section 37.133 Subscription Service

As part of its paratransit service, an entity may include a subscription service component. However, at any given time of day, this component may not absorb more than 50 percent of available capacity on the total system. For example, if, at 8 a.m., the system can provide 400 trips, no more than 200 of these can be subscription trips.

The one exception to this rule would occur in a situation in which there is excess non-subscription capacity available. For example, if over a long enough period of time to establish a pattern, there were only 150 non-subscription trips requested at 8 a.m., the provider could begin to provide 250 subscription trips at that time. Subsequently, if non-subscription demand increased over a period of time, such that the 50 trips were

needed to satisfy a regular non-subscription demand at that time, and overall system capacity had not increased, the 50 trips would have to be returned to the non-subscription category. During times of high subscription demand, entities could use the trip time negotiation discretion of § 37.131(c)(2) to shift some trips to other times.

Because subscription service is a limited subcomponent of paratransit service, the rule permits restrictions to be imposed on its use that could not be imposed elsewhere. There may be a waiting list for provision of subscription service or the use of other capacity constraints. Also, there may be restrictions or priorities based on trip purpose. For example, subscription service under peak work trip times could be limited to work trips. We emphasize that these limitations apply only to subscription service. It is acceptable for a provider to put a person on a waiting list for access to subscription service at 8 a.m. for work trips; the same person could not be wait-listed for access to paratransit service in general.

#### Section 37.135 Submission of Paratransit Plans

This section contains the general requirements concerning the submission of paratransit plans. Each public entity operating fixed route service is required to develop and submit a plan for paratransit service. Where you send your plans depends on the type of entity you are. There are two categories of entities which should submit their plans to states—(1) UMTA recipients and (2) entities who are administered by the state on behalf of UMTA.

These UMTA grantees submit their plans to the states because the agency would like the benefit of the states' expertise before final review. The states' role is as a commenter, not as a reviewer.

This section also specifies annual progress reports concerning the meeting of previously approved milestones, any slippage (with the reasons for it and plans to catch up), and any significant changes in the operator's environment, such as the withdrawal from the marketplace of a private paratransit provider or whose service the entity has relied upon to provide part of its paratransit service.

Paragraph (d) of this section specifies a maximum time period for the phase-in of the implementation of paratransit plans. The Department recognizes that it is not reasonable to expect paratransit systems to spring into existence fully formed, like Athena from the head of Zeus. Under this paragraph, all entities must be in full compliance with all paratransit provisions by January 26, 1997, unless the entity has received a waiver from UMTA based on undue financial burden (which applies only to the service criteria of § 37.131, not to eligibility requirements or other paratransit provisions).

While the rule assumes that most entities will take a year to fully implement these provisions, longer than a year requires the paratransit plans to submit milestones that are susceptible to objective verification. Not all plans will be approved with a five-year

lead-in period. Consistent with the proposed rule, the Department intends to look at each plan individually to see what is required for implementation in each case. DOT may approve only a shorter phase-in period in a given case.

#### Section 37.137 Paratransit Plan Development

Section 35.137 establishes three principal requirements in the development of paratransit plans.

First is the requirement to survey existing paratransit services within the service area. This is required by section 223(c)(8) of the ADA. While the ADA falls short of explicitly requiring coordination, clearly this is one of the goals. The purpose of the survey is to determine what is being provided already, so that a transit provider can accurately assess what additional service is needed to meet the service criteria for comparable paratransit service. The plan does not have to discuss private paratransit providers whose services will not be used to help meet paratransit requirements under this rule. However, the public entity will need to know specifically what services are being provided by whom if the entity is to count the transportation toward the overall need.

Since the public entity is required to provide paratransit to all ADA paratransit eligible individuals, there is some concern that currently provided service may be cut back or eliminated. It is possible that this may happen and such action would have a negative effect on transportation provided to persons with disabilities in general. The Department urges each entity required to submit a plan to work with current providers of transportation, not only to determine what transportation services they provide, but also to continue to provide service into the foreseeable future.

Second, § 37.137 specifies requirements for public participation. First, the entity must perform outreach, to ensure that a wide range of persons anticipated to use the paratransit service know about and have the opportunity to participate in the development of the plan. Not only must the entity identify who these individuals or groups are, the entity also must contact the people at an early stage in the development process.

The other public participation requirements are straightforward. There must be a public hearing and an opportunity to comment. The hearing must be accessible to those with disabilities, and notice of the hearing must be accessible as well. There is a special efforts test identified in this paragraph for comments concerning a multi-year phase-in of a paratransit plan.

The final general requirement of the section specifies that efforts at public participation must be made permanent through some mechanism that provides for participation in all phases of paratransit plan development and submission. The Department is not requiring that there be an advisory committee established, although this is one method of institutionalizing participation. The Department is not as interested in the specific structure used to ensure public participation

as we are interested in the effectiveness of the effort.

The Department believes that public participation is a key element in the effective implementation of the ADA. The ADA is an opportunity to develop programs that will ensure the integration of all persons into not just the transportation system of America, but all of the opportunities transportation makes possible. This opportunity is not without tremendous challenges to the transit providers. It is only through dialogue, over the long term, that usable, possible plans can be developed and implemented.

#### Section 37.139 Plan Contents

This section contains substantive categories of information to be contained in the paratransit plan: Information on current and changing fixed route service; inventory of existing paratransit service; discussion of the discrepancies between existing paratransit and what is required under this regulation; a discussion of the public participation requirements and how they have been met; the plan for paratransit service; the budget for paratransit services; efforts to coordinate with other transportation providers; a description of the process in place or to be used to register ADA paratransit eligible individuals; a description of the documentation provided to each individual verifying eligibility; and a request for a waiver based on undue financial burden, if applicable. The final rule contains a reorganized and slightly expanded section on plan contents, reflecting requests to be more explicit, rather than less explicit.

The list of required elements is the same for all entities required to submit paratransit plans. There is no document length requirement, however. Each entity (or group plan) is unique and we expect the plans to reflect this. While we would like the plan elements presented in the order listed in this section, the contents most likely will vary greatly, depending on the size, geographic area, budget, complexity of issues, etc. of the particular submitting agency.

This section and § 37.139 provide for a maximum phase-in period of five years, with an assumed one-year phase-in for all paratransit programs. (The required budget has been changed to five years as well.) The Department has established a maximum five-year phase-in in the belief that not all systems will require that long, but that some, particularly those which had chosen to meet compliance with section 504 requirements with accessible fixed route service, may indeed need five years.

We are confident that, through the public participation process, entities can develop a realistic plan for full compliance with the ADA. To help ensure this, the paratransit plan contents section now requires that any plan which projects full compliance after January 26, 1993 must include milestones which can be measured and which result in steady progress toward full compliance. For example, it is possible that the first part of year one is used to ensure comprehensive registration of all eligible persons with disabilities, training of transit provider staffs and the development and dissemination of information to users and potential users in

accessible formats and some modest increase in paratransit service is provided. A plan would not be permitted to indicate that no activity was possible in the first year, but proportionately more progress could be planned for later years than for the first year. Implementation must begin in January 1992.

Each plan, including its proposed phase-in period, will be the subject of examination by UMTA. Not all providers who request a five-year phase-in will receive approval for a five-year phase-in. The plan must be careful, therefore, to explain what current services are, what the projections are, and what methods are in place to determine and provide accountability for progress toward full compliance.

We have been asked for assistance in assessing what the demand for paratransit service will be. UMTA's ADA Paratransit Manual provides detailed assistance in this and many other areas of the plan development process.

The ADA itself contained a figure of 43 million persons with disabilities. It should be pointed out that many of these may not necessarily be eligible for ADA paratransit service. The Department's regulatory impact analysis discussing the probable costs involved in implementing this rule places the possible percentage of population who would be eligible for paratransit service at between 1.4 and 1.9 percent. This figure can vary depending on the type and variety of services you have available, or on such things as climate, proximity to medical care, family, etc. that a person with a disability may need. Clearly estimating demand is one of the most critical elements in the plan, since it will be used to make decisions about all of the various service criteria.

Section 37.139 contains a new paragraph (j), spelling out in more detail requirements related to the annual submission of plans. Since there is now the possibility for five-year phase-ins, the annual plan demonstrates the progress made to date, and explains any delays.

#### Section 37.141 Requirements If a Joint Plan is Submitted

The Department believes that, particularly in large, multi-provider regions, a coordinated regional paratransit plan and system are extremely important. Such coordination can do much to ensure that the most comprehensive transportation can be provided with the most efficient use of available resources. We recognize that the effort of putting together such a coordinated system can be a lengthy one. This section is intended to facilitate the process of forming such a coordinated system.

If a number of entities wish to submit a joint plan for a coordinated system, they must, like other entities, submit a document by January 26, 1992. At a minimum, this document must include the following:

- (1) A general statement that the participating entities intend to file a joint coordinated plan;
- (2) A certification from each participating entity that it is committed to providing paratransit as a part of a coordinated plan;
- (3) A certification from each participating entity that it will maintain at least current

levels of paratransit service until the coordinated paratransit service called for by the joint plan is implemented;

(4) As many elements of the plan as possible.

These provisions ensure that significant planning will precede, and plan implementation will begin by, January 26, 1992, without precluding entities from cooperating because it was not possible to complete coordinating different public entities by that date. The entities involved in a joint plan are required to submit all elements of their plan by July 26, 1992.

The final provision in the section notes that an entity may later join a coordinated plan, even if it has filed its own plan on January 26, 1992. An entity must submit its own plan by January 26, 1992, if it has not provided a certification of participation in a joint plan. In this case, the entity must provide the assurances and certifications required of all of the other participating entities.

The Department fully expects that many jurisdictions filing joint plans will be able to do so by January 26, 1992. For those who cannot, the regulatory provision ensures that there will be no decrease in paratransit service. Further, since we anticipate coordinated service areas to provide more effective service, complete implementation of a joint plan could be more rapid than if each entity was providing service on its own.

Entities submitting a joint plan do not have any longer than any other entities to fully implement complementary paratransit service. In any case, all plans (joint or single) must be fully implemented by January 26, 1992, absent a waiver for undue financial burden (which would, in the case of a joint plan, be considered on a joint basis).

#### Section 37.143 Paratransit Plan Implementation

As already discussed under § 37.135, the states will receive UMTA recipient plans for section 18 recipients administered by the State or any small urbanized area recipient section 9 funds administered by a state. Public entities who do not receive UMTA funds will submit their plans directly to the applicable Regional Office (listed in appendix B to the rule).

The role of the state is to accept the plans on behalf of UMTA, to ensure that all plans are submitted to it and forward the plans, with any comments on the plans, to UMTA. This comment is very important for UMTA to receive, since states administer these programs on behalf of UMTA. Each state's specific knowledge of UMTA grantees it administers will provide helpful information to UMTA in making its decisions.

The rule lists five questions the states must answer when they forward the plans. These questions are gauged to capitalize on the working knowledge the states possess on the grantees. UMTA will send a more specific letter of instruction to each state explaining its role.

#### Section 37.147 UMTA Review of Plans

This provision spells out factors UMTA will consider in reviewing each plan, including whether the submission is complete, whether the plan complies with the



substance of the ADA regulation, whether the entity complied with the public participation requirements in developing the plan, efforts by the entity to coordinate with other entities in a plan submission, and any comments submitted by the states.

These elements are not the only items that will be reviewed by UMTA. Every portion of the plan will be reviewed and assessed for compliance with the regulation. This section merely highlights those provisions thought most important by the Department.

#### *Section 37.151 Waiver for Undue Financial Burden*

The Department has adopted a five-year phase-in for paratransit service. Under this scheme, each entity required to provide paratransit service will be able to design a phase-in of its service specifically geared to local circumstances. While all jurisdictions will not receive approval for plans with a five year phase-in, each entity will be able to request what it needs based on local circumstances. Generally, the section allows an entity to request a waiver at any time it determines that it will not be able to meet a five-year phase-in or make measured progress toward its full compliance date specified in its original plan.

A waiver for undue financial burden should be requested if one of the following circumstances applies. First, when the entity submits its first plan on January 26, 1992, if the entity knows it will not be able to reach full compliance within five years, or if the entity cannot make measured progress the first year it may submit a waiver request. The entity also should apply for a waiver, if, during plan implementation, there are changed circumstances which make it unlikely that compliance will be possible.

The concept of measured progress should be given its plain meaning. It is not acceptable to submit a plan which shows significant progress in implementing a plan in years four and five, but no progress in years one and two. Similarly, the progress must be susceptible to objective verification. An entity cannot merely "work toward" developing a particular aspect of a plan.

The Department intends that undue burden waiver requests will be given close scrutiny, and waiver will not be granted lightly. In reviewing requests, however, as the legislative history indicates, UMTA will look at the individual financial constraints within which each public entity operates its fixed route system. "Any determination of undue financial burden cannot have assumed the collection of additional revenues, such as those received through increases in local taxes or legislative appropriations, which would not have otherwise been made available to the fixed route operator." (H. Rept. 101-485, Pt. 1, at 31)

#### *Section 37.153 UMTA Waiver Determination*

If the UMTA Administrator grants a waiver for undue financial burden, the waiver will be for a specified period of time and the Administrator will determine what the entity must do to meet its responsibilities under the ADA. Each determination will involve a judgment of what is appropriate on a case-

by-case basis. Since each waiver will be granted based on individual circumstances, the Department does not deem it appropriate to specify a generally applicable duration for a waiver.

When a waiver is granted, the rule calls for entities to look first at limiting the number of trips provided to each individual as a means of providing service that does not create an undue burden. This capacity constraint, unlike manipulations of other service criteria, will not result in a degradation of the quality of service. An entity intending to submit an undue burden waiver request should take this approach into account in its planning process.

It should be noted that requiring an entity to provide paratransit service at least during core hours along key routes is one option that the Administrator has available in making a decision about the service to be provided. This requirement stems from the statutory provision that the Administrator can require the entity to provide a minimum level of service, even if to do so would be an undue financial burden. Certainly part of a request for a waiver could be a locally endorsed alternative to this description of basic service. The rule states explicitly the Administrator's discretion to return the application for more information if necessary.

#### *Section 37.155 Factors in Decision to Grant an Undue Financial Burden Waiver*

Factors the Administrator will consider in making a decision whether to grant an undue financial burden waiver request include effects on current fixed route service, reductions in other services, increases in fares, resources available to implement complementary paratransit over the period of the plan, current level of accessible service (fixed route and paratransit), cooperation among transit providers, evidence of increased efficiencies that have been or could be used, any unique circumstances that may affect the entity's ability to provide paratransit service, the level of per capita service being provided, both to the population as a whole and what is being or anticipated to be provided to persons who are eligible and registered to receive ADA paratransit service.

This final element allows some measure of comparability, regardless of the specific service criteria and should assist in a general assessment of level of effort.

It is only the costs associated with providing paratransit service to ADA-paratransit eligible persons that can be counted in assessing whether or not there is an undue financial burden. Two cost factors are included in the considerations which enhance the Administrator's ability to assess real commitment to these paratransit provisions.

First, the Department will allow a statistically valid methodology for estimating number of trips mandated by the ADA. While the regulation calls for a trip-by-trip determination of eligibility, this provision recognizes that this is not possible for some systems, particularly the large systems. Since only those trips provided to a person when he or she is ADA eligible may be counted in determining an undue financial burden, this provision is necessary.

Second, in determining costs to be counted toward providing paratransit service, paragraph (b)(3) allows an entity to include in its paratransit budget dollars to which it is legally entitled, but which, as a matter of state or local funding arrangements, are provided to another entity that is actually providing the paratransit service.

For example, a state government may provide a certain formula allocation of the revenue from a certain tax to each jurisdiction for use in providing transportation service at the local level. The funds, depending on local arrangements, may flow either to a transit authority—a regulated entity under this rule—or to a city or county government. If the funds go to the transit authority, they clearly may be counted in an undue burden calculation. In addition, however, this provision also allows funds that flow through the city or county government to be counted in the undue burden calculation, since they are basically the same funds and should not be treated differently based on the accident of previously-determined local arrangements. On the other hand, this provision does not allow funds of a private non-profit or other organization who uses Department of Health and Human Services grant or private contributions to be counted toward the entity's financial commitment to paratransit.

#### **Subpart G—Provision of Service**

##### *Section 37.161 Maintenance of Accessible Features—General*

This section applies to all entities providing transportation services, public and private. It requires those entities to maintain in operative condition those features or facilities and equipment that make facilities and vehicles accessible to and usable by individuals with disabilities.

The ADA requires that, to the maximum extent feasible, facilities be accessible to and usable by individuals with disabilities. This section recognizes that it is not sufficient to provide features such as lift-equipped vehicles, elevators, communications systems to provide information to people with vision or hearing impairments, etc. if these features are not maintained in a manner that enables individuals with disabilities to use them. Inoperative lifts or elevators, locked accessible doors, accessible paths of travel that are blocked by equipment or boxes of materials are not accessible to or usable by individuals with disabilities.

The rule points out that temporary obstructions or isolated instances of mechanical failure would not be considered violations of the ADA or this rule. Repairs must be made "promptly." The rule does not, and probably could not, state a time limit for making particular repairs, given the variety of circumstances involved. However, repairing accessible features must be made a high priority. Allowing obstructions or out of order accessibility equipment to persist beyond a reasonable period of time would violate this Part, as would mechanical failures due to improper or inadequate maintenance. Failure of the entity to ensure that accessible routes are free of obstruction and properly maintained, or failure to arrange prompt

repair of inoperative elevators, lifts, or other accessibility-related equipment, would also violate this part.

The rule also requires that accommodations be made to individuals with disabilities who would otherwise use an inoperative accessibility feature. For example, when a rail system discovers that an elevator is out of order, blocking access to one of its stations, it could accommodate users of the station by announcing the problem at other stations to alert passengers and offer accessible shuttle bus service around the temporarily inaccessible station. If a public address system were out of order, the entity could designate personnel to provide information to customers with visual impairments.

#### *Section 37.163 Keeping Vehicle Lifts in Operative Condition—Public Entities*

This section applies only to public entities. Of course, like vehicle acquisition requirements and other provisions applying to public entities, these requirements also apply when private entities "standing in the shoes" of public entities in contracting situations, as provided in § 37.23.

This section's first requirement is that the entity establish a system of regular and frequent maintenance checks of lifts sufficient to determine if they are operative.

Vehicle and equipment maintenance is an important component of successful accessible service. In particular, an aggressive preventive maintenance program for lifts is essential. Lifts remain rather delicate pieces of machinery, with many moving parts, which often must operate in a harsh environment of potholes, dust and gravel, variations in temperature, snow, slush, and deicing compounds. It is not surprising that they sometimes break down.

The point of a preventive maintenance program is to prevent breakdowns, of course. But it is also important to catch broken lifts as soon as possible, so that they can be repaired promptly. Especially in a bus system with relatively low lift usage, it is possible that a vehicle could go for a number of days without carrying a passenger who uses the lift. It is highly undesirable for the next passenger who needs a lift to be the person who discovers that the lift is broken, when a maintenance check by the operator could have discovered the problem days earlier, resulting in its repair.

Therefore, the entity must have a system for regular and frequent checks, sufficient to determine if lifts are actually operative. This is not a requirement for the lift daily. (Indeed, it is not, as such, a requirement for lift cycling at all. If there is another means available of checking the lift, it may be used.) If alternate day checks, for example, are sufficient to determine that lifts are actually working, then they are permitted. If a lift is used in service on a given day, that may be sufficient to determine that the lift is operative with respect to the next day. It would be a violation of this part, however, for the entity to neglect to check lifts regularly and frequently, or to exhibit a pattern of lift breakdowns in service resulting in stranded passengers when the lifts had not been checked before the vehicle failed to provide required accessibility to passengers that day.

When a lift breaks down in service, the driver must let the entity know about the problem by the most immediate means available. If the vehicle is equipped with a radio or telephone, the driver must call in the problem on the spot. If not, then the driver would have to make a phone call at the first opportunity (e.g., from a phone booth during the turnaround time at the end of the run). It is not sufficient to wait until the end of the day and report the problem when the vehicle returns to the barn.

When a lift is discovered to be inoperative, either because of an in-service failure or as the result of a maintenance check, the entity must take the vehicle out of service before the beginning of its next service day (with the exception discussed below) and repair the lift before the vehicle is put back into service. In the case of an in-service failure, this means that the vehicle can continue its runs on that day, but cannot start a new service day before the lift is repaired. If a maintenance check in the evening after completion of a day's run or in the morning before a day's runs discloses the problem, then the bus would not go into service until the repair had taken place.

The Department realizes that, in the years before bus fleets are completely accessible, taking buses with lifts out of service for repairs in this way would probably result in an inaccessible spare bus being used on the route, but at least attention would have to be paid quickly to the lift repair, resulting in a quicker return to service of a working accessible bus.

The rule provides an exception for those situations in which there is no spare vehicle (either accessible or inaccessible) available to take the place of the vehicle with an operative lift, such that putting the latter vehicle into the shop would result in a reduction of service to the public (e.g., a scheduled run on a route could not be made). The Department would emphasize that the exception does not apply when there is any spare vehicle available.

Where the exception does apply, the provider may keep the vehicle with the inoperative lift in service for a maximum of three days (for providers operating in an area of over 50,000 population) or five days (for providers operating in an area of 50,000 population or less). After these times have elapsed, the vehicle must go into the shop, not to return until the lift is repaired. Even during the three- or five-day period, if an accessible spare bus becomes available at any time, it must be used in place of the bus with the inoperative lift or an inaccessible spare that is being used in its place.

In a fixed route system, if a bus is operating without a working lift (either on the day when the lift fails in service or as the result of the exception discussed above) and headways between accessible buses on the route on which the vehicle is operating exceed 30 minutes, the entity must accommodate passengers who would otherwise be inconvenienced by the lack of an accessible bus. This accommodation would be by a paratransit or other special vehicle that would pick up passengers with disabilities who cannot use the regular bus because its lift is inoperative. Passengers

who need lifts in this situation would, in effect, be ADA paratransit eligible under the second eligibility category. However, since they would have no way of knowing that the bus they sought to catch would not be accessible that day, the transit authority must actively provide alternative service to them. This could be done, for example, by having a "shadow" accessible service available along the route or having the bus driver call in the minute he saw an accessible passenger he could not pick up (including the original passenger stranded by an in-service lift failure), with a short (i.e., less than 30-minute) response from an accessible vehicle dispatched to pick up the stranded passenger. To minimize problems in providing such service, when a transit authority is using the "no spare vehicles" exception, the entity could place the vehicle with the inoperative lift on a route with headways between accessible buses shorter than 30 minutes.

#### *Section 37.165 Lift and Securement Use*

This provision applies to both public and private entities.

All people using common wheelchairs (an inclusive term for mobility devices that fit on lifts meeting Access Board guideline dimensions—30" by 48" and a maximum of 600 pounds for device and user combined—which includes three-wheeled scooters and other so-called non-traditional mobility devices) are to be allowed to ride the entity's vehicles.

Entities may require wheelchair users to ride in designated securement locations. That is, the entity is not required to carry wheelchair users whose wheelchairs would have to park in an aisle or other location where they could obstruct other persons' passage or where they could not be secured or restrained. An entity's vehicle is not required to pick up a wheelchair user when the securement locations are full, just as the vehicle may pass by other passengers waiting at the stop if the bus is full.

The entity may require that wheelchair users make use of securement systems for their mobility devices. The entity, in other words, can require wheelchair users to "buckle up" their mobility devices. The entity is required, on a vehicle meeting Part 38 standards, to use the securement system to secure wheelchairs as provided in that Part. On other vehicles (e.g., existing vehicles with securement systems which do not comply with Part 38 standards), the entity must provide and use a securement system to ensure that the mobility device remains within the securement area. This latter requirement is a mandate to use best efforts to restrain or confine the wheelchair to the securement area. The entity does the best it can, given its securement technology and the nature of the wheelchair. The Department encourages entities with relatively less adequate securement systems on their vehicles, where feasible, to retrofit the vehicles with better securement systems, that can successfully restrain a wide variety of wheelchairs. It is our understanding that the cost of doing so is not enormous.

An entity may not, in any case, deny transportation to a common wheelchair and

its user because the wheelchair cannot be secured or restrained by a vehicle's securement system, to the entity's satisfaction.

Entities have often recommended or required that a wheelchair user transfer out of his or her own device into a vehicle seat. Under this rule, it is no longer permissible to require such a transfer. The entity may provide information on risks and make a recommendation with respect to transfer, but the final decision on whether to transfer is up to the passenger.

The entity's personnel have an obligation to ensure that a passenger with a disability is able to take advantage of the accessibility and safety features on vehicles.

Consequently, the driver or other personnel must provide assistance with the use of lifts, ramps, and securement devices. For example, the driver must deploy the lift properly and safely. If the passenger cannot do so independently, the driver must assist the passenger with using the securement device. On a vehicle which uses a ramp for entry, the driver may have to assist in pushing a manual wheelchair up the ramp (particularly where the ramp slope is relatively steep). All these actions may involve a driver leaving his seat. Even in entities whose drivers traditionally do not leave their seats (e.g., because of labor-management agreements or company rules), this assistance must be provided. This rule overrides any requirements to the contrary.

Wheelchair users—especially those using electric wheelchairs often have a preference for entering a lift platform and vehicle in a particular direction (e.g., backing on or going on frontwards). Except where the only way of successfully maneuvering a device onto a vehicle or into its securement area, or an overriding safety concern (i.e., a direct threat) requires one way of doing this or another, the transit provider should respect the passenger's preference. We note that most electric wheelchairs are usually not equipped with rearview mirrors, and that many persons who use them are not able to rotate their heads sufficiently to see behind. When an electric wheelchair must back up a considerable distance, this can have unfortunate results for other people's toes.

People using canes or walkers and other standees with disabilities who do not use wheelchairs but have difficulty using steps (e.g., an elderly person who can walk on a plane without use of a mobility aid but cannot raise his or her legs sufficiently to climb bus steps) must also be permitted to use the lift, on request.

#### *Section 37.167 Other Service Requirements*

The requirements in this section apply to both public and private entities.

On fixed route systems, the entity must announce stops. These stops include transfer points with other fixed routes. This means that any time a vehicle is to stop where a passenger can get off and transfer to another bus or rail line (or to another form of transportation, such as commuter rail or ferry), the stop would be announced. The announcement can be made personally by the vehicle operator or can be made by a recording system. If the vehicle is small

enough so that the operator can make himself or herself heard without a P.A. system, it is not necessary to use the system.

Announcements also must be made at major intersections or destination points. The rule does not define what major intersections or destination points are. This is a judgmental matter best left to the local planning process. In addition, the entity must make announcements at sufficient intervals along a route to orient a visually impaired passenger to his or her location. The other required announcements may serve this function in many instances, but if there is a long distance between other announcements, fill-in orientation announcements would be called for. The entity must announce any stop requested by a passenger with a disability, even if it does not meet any of the other criteria for announcement.

When vehicles from more than one route serve a given stop or station, the entity must provide a means to assist an individual with a visual impairment or other disability in determining which is the proper vehicle to enter. Some entities have used external speakers. UMTA is undertaking a study to determine what is the best available technology in this area. Some transit properties have used colored mitts, or numbered cards, to allow passengers to inform drivers of what route they wanted to use. The idea is to prevent, at a stop where vehicles from a number of routes arrive, a person with a visual impairment from having to ask every driver whether the bus is the right one. The rule does not prescribe what means is to be used, only that some effective means be provided.

Service animals shall always be permitted to accompany their users in any private or public transportation vehicle or facility. One of the most common misunderstandings about service animals is that they are limited to being guide dogs for persons with visual impairments. Dogs are trained to assist people with a wide variety of disabilities, including individuals with hearing and mobility impairments. Other animals (e.g., monkeys) are sometimes used as service animals as well. In any of these situations, the entity must permit the service animal to accompany its user.

Part 38 requires a variety of accessibility equipment. This section requires that the entity use the equipment it has. For example, it would be contrary to this provision for a transit authority to bolt its bus lifts shut because transit authority had difficulty maintaining the lifts. It does little good to have a public address system on a vehicle if the operator does not use it to make announcements (except, as noted above, in the situation where the driver can make himself or herself heard without recourse to amplification.)

Entities must make communications and information available, using accessible formats and technology (e.g., Braille, large print, TDDs) to obtain information about transportation services. Someone cannot adequately use the bus system if schedule and route information is not available in a form he or she can use. If there is only one phone line on which ADA paratransit eligible individuals can reserve trips, and the line is

chronically busy, individuals cannot schedule service. Such obstacles to the use of transportation service are contrary to this section. (The latter could, in some circumstances, be viewed as a capacity constraint.)

It is inconsistent with this section for a transit provider to refuse to let a passenger use a lift at any designated stop, unless the lift is physically unable to deploy or the lift would be damaged if it did deploy (see discussion under § 37.123). In addition, if a temporary situation at the stop (e.g., construction, an accident, a landslide) made the stop unsafe for anyone to use, the provider could decline to operate the lift there (just as it refused to open the door for other passengers at the same point). The provider could not, however, declare a stop "off limits" to persons with disabilities that is "off" for other persons. If the transit authority has concerns about barriers or safety hazards that peculiarly affect individuals with disabilities that would use the stop, it should consider making efforts to move the stop.

Under DOT hazardous materials rules, a passenger may bring a portable medical oxygen supply on board a vehicle. Since the hazardous materials rules permit this, transit providers cannot prohibit it. For further information on hazardous materials rules, as they may affect transportation of assistive devices, entities may contact the Department's Research and Special Programs Administration, Office of Hazardous Materials Transportation (202-366-0656).

One concern that has been expressed is that transportation systems (particularly some rail systems) may make it difficult for persons with disabilities to board or disembark from vehicles by very rapidly closing doors on the vehicles before individuals with disabilities (who may move more slowly through crowds in the vehicle or platform than other persons) have a chance to get on or off the vehicle. Doing so is contrary to the rule; operators must make appropriate provision to give individuals with disabilities adequate time to board or disembark.

#### *Section 37.169 Interim Requirements for Over-the-Road Bus Service Operated by Private Entities*

Private over-the-road bus (OTRB) service is, first of all, subject to all the other private entity requirements of the rule. The requirements of this section are in addition to the other applicable provisions.

Boarding assistance is required. The Department cannot require any particular boarding assistance devices at this time. Each operator may decide what mode of boarding assistance is appropriate for its operation. We agree with the discussion in the DOJ Title II rule's preamble that carrying is a disfavored method of providing assistance to an individual with a disability. However, since accessible private OTRBs cannot be required by this rule, there may be times when carrying is the only available means of providing access to an OTRB, if the entity does not exercise its discretion to provide an alternative means. It is required by the rule that any employee who provides



boarding assistance—above all, who may carry or otherwise directly physically assist a passenger—must be trained to provide this assistance appropriately and safely.

The baggage priority provision for wheelchairs and other assistive devices involves a similar procedure to that established in the Department's Air Carrier Access Act rule (14 CFR part 382). In brief, it provides that, at any given stop, a person with a wheelchair or other assistive device would have the device loaded before other items at this stop. An individual traveling with a wheelchair is not similarly situated to a person traveling with luggage. For the wheelchair user, the wheelchair is an essential mobility device, without which travel is impossible. The rationale of this provision is that, while no one wants his or her items left behind, carrying the wheelchair is more important to its user than ordinary luggage to a traveler. If it comes to an either/or choice (the wheelchair user's luggage would not have any priority over other luggage, however). There would be no requirement, under this provision, for "bumping" baggage already on the bus from previous stops in order to make room for the wheelchair.

The entity could require advance notice from a passenger in only one circumstance. If a passenger needed boarding assistance, the entity could require up to 48 hours' advance notice for the purpose of providing needed assistance. While advance notice requirements are generally undesirable, this appears to be a case in which a needed accommodation may be able to be provided successfully only if the transportation provider knows in advance that some extra staffing is needed to accomplish it. While the primary need for advance notice appears to be in the situation of an unstaffed station, there could be other situations in which advance notice was needed in order to ensure that the accommodation could be made. Entities should not ask for advance notice in all cases, but just in those cases in which it is really needed for this purpose. Even if advance notice is not provided, the entity has the obligation to provide boarding assistance if it can be provided with available staff.

*Section 37.171 Equivalency Requirement for Demand Responsive Service Operated by Private Entities Not Primarily in the Business of Transporting People*

This provision is a service requirement closely related to the private entity requirements for §§ 37.101–37.105 of this part. Entities in this category are always required to provide equivalent service, regardless of what they are doing with respect to the acquisition of vehicles. The effect of this provision may be to require some entities to arrange, either through acquiring their own accessible vehicles or coordinating with other providers, to have accessible vehicles available to meet the equivalency standards of § 37.105 or otherwise to comply with those standards.

*Section 37.173 Training*

A well-trained workforce is essential in ensuring that the accessibility-related

equipment and accommodations required by the ADA actually result in the delivery of good transportation service to individuals with disabilities. The utility of training was recognized by Congress as well. (See S. Rept. 100–116 at 48.) At the same time, we believe that training should be conducted in an efficient and effective manner, with appropriate flexibility allowed to the organizations that must carry it out. Each transportation provider is to design a training program which suits the needs of its particular operation. While we are confident of this approach, we are mindful that the apparent lack of training has been a source of complaint to UMTA and transit providers. Good training is difficult and it is essential.

Several points of this section deserve emphasis. First, the requirements for training apply to private as well as to public providers, of demand responsive as well as of fixed route service. Training is just as necessary for the driver of a taxicab, a hotel shuttle, or a tour bus as it is for a driver in an UMTA-funded city bus system.

Second, training must be to proficiency. The Department is not requiring a specific course of training or the submission of a training plan for DOT approval. However, every employee of a transportation provider who is involved with service to persons with disabilities must have been trained so that he or she knows what needs to be done to provide the service in the right way. When it comes to providing service to individuals with disabilities, ignorance is no excuse for failure.

While there is no specific requirement for recurrent or refresher training, there is an obligation to ensure that, at any given time, employees are trained to proficiency. An employee who has forgotten what he was told in past training sessions, so that he or she does not know what needs to be done to serve individuals with disabilities, does not meet the standard of being trained to proficiency.

Third, training must be appropriate to the duties of each employee. A paratransit dispatcher probably must know how to use a TDD and enough about various disabilities to know what sort of vehicle to dispatch. A bus driver must know how to operate lifts and securement devices properly. A mechanic who works on lifts must know how to maintain them. Cross-training, while useful in some instances, is not required, so long as each employee is trained to proficiency in what he or she does with respect to service to individuals with disabilities.

Fourth, the training requirement goes both to technical tasks and human relations. Employees obviously need to know how to run equipment the right way. If an employee will be assisting wheelchair users in transferring from a wheelchair to a vehicle seat, the employee needs training in how to do this safely. But every public contact employee also has to understand the necessity of treating individuals with disabilities courteously and respectfully, and the details of what this involves.

One of the best sources of information on how best to train personnel to interact appropriately with individuals with disabilities is the disability community itself.

Consequently, the Department urges entities to consult with disability organizations concerning how to train their personnel. Involving these groups in the process of establishing training programs, in addition to providing useful information, should help to establish or improve working relationships among transit providers and disability groups that, necessarily, will be of long duration. We note that several transit providers use persons with disabilities to provide the actual training. Others have reported that role playing is an effective method to instill an appreciation of the particular perspective of one traveling with a disability.

Finally, one of the important points in training concerns differences among individuals with disabilities. All individuals with disabilities, of course, are not alike. The appropriate ways one deals with persons with various kinds of disabilities (e.g., mobility, vision, hearing, or mental impairments) are likely to differ and, while no one expects bus drivers to be trained as disability specialists, recognizing relevant differences and responding to them appropriately is extremely significant. Public entities who contract with private entities to have service provided—above all, complementary paratransit—are responsible for ensuring that contractor personnel receive the appropriate training.

Title 49, Code of Federal Regulations, is amended by adding a new part 38, to read as follows:

**PART 38—AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY SPECIFICATIONS FOR TRANSPORTATION VEHICLES**

**Subpart A—General**

- Sec.
- 38.1 Purpose.
- 38.2 Equivalent facilitation.
- 38.3 Definitions.
- 38.4 Miscellaneous instructions.

**Subpart B—Buses, Vans and Systems**

- 38.21 General.
- 38.23 Mobility aid accessibility.
- 38.25 Doors, steps and thresholds.
- 38.27 Priority seating signs.
- 38.29 Interior circulation, handrails and stanchions.
- 38.31 Lighting.
- 38.33 Fare box.
- 38.35 Public information system.
- 38.37 Stop request.
- 38.39 Destination and route signs.

**Subpart C—Rapid Rail Vehicles and Systems**

- 38.51 General.
- 38.53 Doorways.
- 38.55 Priority seating signs.
- 38.57 Interior circulation, handrails and stanchions.
- 38.59 Floor surfaces.
- 38.61 Public information system.
- 38.63 Between-car barriers.



**Subpart D—Light Rail Vehicles and Systems**

- 38.71 General.
- 38.73 Doorways.
- 38.75 Priority seating signs.
- 38.77 Interior circulation, handrails and stanchions.
- 38.79 Floors, steps and thresholds.
- 38.81 Lighting.
- 38.83 Mobility aid accessibility.
- 38.85 Between-car barriers.
- 38.87 Public information system.

**Subpart E—Commuter Rail Cars and Systems**

- 38.91 General.
- 38.93 Doorways.
- 38.95 Mobility aid accessibility.
- 38.97 Interior circulation, handrails and stanchions.
- 38.99 Floors, steps and thresholds.
- 38.101 Lighting.
- 38.103 Public information system.
- 38.105 Priority seating signs.
- 38.107 Restrooms.
- 38.109 Between-car barriers.

**Subpart F—Intercity Rail Cars and Systems**

- 38.111 General.
- 38.113 Doorways.
- 38.115 Interior circulation, handrails and stanchions.
- 38.117 Floors, steps and thresholds.
- 38.119 Lighting.
- 38.121 Public information system.
- 38.123 Restrooms.
- 38.125 Mobility aid accessibility.
- 38.127 Sleeping compartments.

**Subpart G—Over-the-Road Buses and Systems**

- 38.151 General.
- 38.153 Doors, steps and thresholds.
- 38.155 Interior circulation, handrails and stanchions.
- 38.157 Lighting.
- 38.159 Mobility aid accessibility. [Reserved]

**Subpart H—Other Vehicles and Systems**

- 38.171 General.
- 38.173 Automated guideway transit vehicles and systems.
- 38.175 High-speed rail cars, monorails and systems.
- 38.177 Ferries, excursion boats and other vessels. [Reserved]
- 38.179 Trams, and similar vehicles, and systems.

**Figures in Part 38****Appendix to Part 38: Guidance Material**

Authority: Americans With Disabilities Act of 1990, Public Law. 101-336 (42 U.S.C. 12204); 49 U.S.C. 322.

**Subpart A—General****§ 38.1 Purpose.**

This part provides minimum guidelines and requirements for accessibility standards in part 37 of this title for transportation vehicles required to be accessible by the Americans With Disabilities Act (ADA) of 1990 (42 U.S.C. 1201 et seq.).

**§ 38.2 Equivalent facilitation.**

Departures from particular technical and scoping requirements of these guidelines by use of other designs and technologies are permitted where the alternative designs and technologies used will provide substantially equivalent or greater access to and usability of the vehicle. Departures are to be considered on a case-by-case basis under procedures set forth in § 37.7 of this title.

**§ 38.3 Definitions.**

See § 37.3 of this title.

**§ 38.4 Miscellaneous instructions.**

(a) *Dimensional conventions.*

Dimensions that are not noted as minimum or maximum are absolute.

(b) *Dimensional tolerances.*

All dimensions are subject to conventional engineering tolerances for material properties and field conditions, including normal anticipated wear not exceeding accepted industry-wide standards and practices.

(c) *Notes.* The text of these guidelines does not contain notes or footnotes. Additional information, explanations, and advisory materials are located in the Appendix.

(d) *General terminology.* (1) *Comply* with means meet one or more specification of these guidelines.

(2) *If or if . . . then* denotes a specification that applies only when the conditions described are present.

(3) *May* denotes an option or alternative.

(4) *Shall* denotes a mandatory specification or requirement.

(5) *Should* denotes an advisory specification or recommendation.

**Subpart B—Buses, Vans and Systems****§ 38.21 General.**

(a) New, used or remanufactured buses and vans (except over-the-road buses covered by subpart G of this part), to be considered accessible by regulations in part 37 of this title shall comply with the applicable provisions of this subpart.

(b) If portions of the vehicle are modified in a way that affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible buses be retrofitted with lifts, ramps or other boarding devices.

**§ 38.23 Mobility aid accessibility.**

(a) *General.* All vehicles covered by this subpart shall provide a level-change mechanism or boarding device (e.g., lift or ramp) complying with paragraph (b)

or (c) of this section and sufficient clearances to permit a wheelchair or other mobility aid user to reach a securement location. At least two securement locations and devices, complying with paragraph (d) of this section, shall be provided on vehicles in excess of 22 feet in length; at least one securement location and device, complying with paragraph (d) of this section, shall be provided on vehicles 22 feet in length or less.

(b) *Vehicle lift—(1) Design load.* The design load of the lift shall be at least 600 pounds. Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Nonworking parts, such as platform, frame, and attachment hardware which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material.

(2) *Controls—(i) Requirements.* The controls shall be interlocked with the vehicle brakes, transmission, or door, or shall provide other appropriate mechanisms or systems, to ensure that the vehicle cannot be moved when the lift is not stowed and so the lift cannot be deployed unless the interlocks or systems are engaged. The lift shall deploy to all levels (i.e., ground, curb, and intermediate positions) normally encountered in the operating environment. Where provided, each control for deploying, lowering, raising, and stowing the lift and lowering the roll-off barrier shall be of a momentary contact type requiring continuous manual pressure by the operator and shall not allow improper lift sequencing when the lift platform is occupied. The controls shall allow reversal of the lift operation sequence, such as raising or lowering a platform that is part way down, without allowing an occupied platform to fold or retract into the stowed position.

(ii) *Exception.* Where the lift is designed to deploy with its long dimension parallel to the vehicle axis and which pivots into or out of the vehicle while occupied (i.e., "rotary lift"), the requirements of this paragraph prohibiting the lift from being stowed while occupied shall not apply if the stowed position is within the passenger compartment and the lift is intended to be stowed while occupied.

(3) *Emergency operation.* The lift shall incorporate an emergency method of deploying, lowering to ground level with a lift occupant, and raising and stowing the empty lift if the power to the lift

fails. No emergency method, manual or otherwise, shall be capable of being operated in a manner that could be hazardous to the lift occupant or to the operator when operated according to manufacturer's instructions, and shall not permit the platform to be stowed or folded when occupied, unless the lift is a rotary lift and is intended to be stowed while occupied.

**(4) Power or equipment failure.**

Platforms stowed in a vertical position, and deployed platforms when occupied, shall have provisions to prevent their deploying, falling, or folding any faster than 12 inches/second or their dropping of an occupant in the event of a single failure of any load carrying component.

**(5) Platform barriers.** The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair or mobility aid from rolling off the platform during its operation. A movable barrier or inherent design feature shall prevent a wheelchair or mobility aid from rolling off the edge closest to the vehicle until the platform is in its fully raised position. Each side of the lift platform which extends beyond the vehicle in its raised position shall have a barrier a minimum 1½ inches high. Such barriers shall not interfere with maneuvering into or out of the aisle. The loading-edge barrier (outer barrier) which functions as a loading ramp when the lift is at ground level, shall be sufficient when raised or closed, or a supplementary system shall be provided, to prevent a power wheelchair or mobility aid from riding over or defeating it. The outer barrier of the lift shall automatically raise or close, or a supplementary system shall automatically engage, and remain raised, closed, or engaged at all times that the platform is more than 3 inches above the roadway or sidewalk and the platform is occupied. Alternatively, a barrier or system may be raised, lowered, opened, closed, engaged, or disengaged by the lift operator, provided an interlock or inherent design feature prevents the lift from rising unless the barrier is raised or closed or the supplementary system is engaged.

**(6) Platform surface.** The platform surface shall be free of any protrusions over ¼ inch high and shall be slip resistant. The platform shall have a minimum clear width of 28½ inches at the platform, a minimum clear width of 30 inches measured from 2 inches above the platform surface to 30 inches above the platform, and a minimum clear length of 48 inches measured from 2 inches above the surface of the platform to 30 inches above the surface of the platform. (See Fig. 1)

**(7) Platform gaps.** Any openings between the platform surface and the raised barriers shall not exceed ¾ inch in width. When the platform is at vehicle floor height with the inner barrier (if applicable) down or retracted, gaps between the forward lift platform edge and the vehicle floor shall not exceed ½ inch horizontally and ¾ inch vertically. Platforms on semi-automatic lifts may have a hand hold not exceeding 1½ inches by 4½ inches located between the edge barriers.

**(8) Platform entrance ramp.** The entrance ramp, or loading-edge barrier used as a ramp, shall not exceed a slope of 1:8, measured on level ground, for a maximum rise of 3 inches, and the transition from roadway or sidewalk to ramp may be vertical without edge treatment up to ¼ inch. Thresholds between ¼ inch and ½ inch high shall be beveled with a slope no greater than 1:2.

**(9) Platform deflection.** The lift platform (not including the entrance ramp) shall not deflect more than 3 degrees (exclusive of vehicle roll or pitch) in any direction between its unloaded position and its position when loaded with 600 pounds applied through a 26 inch by 26 inch test pallet at the centroid of the platform.

**(10) Platform movement.** No part of the platform shall move at a rate exceeding 6 inches/second during lowering and lifting an occupant, and shall not exceed 12 inches/second during deploying or stowing. This requirement does not apply to the deployment or stowage cycles of lifts that are manually deployed or stowed. The maximum platform horizontal and vertical acceleration when occupied shall be 0.3g.

**(11) Boarding direction.** The lift shall permit both inboard and outboard facing of wheelchair and mobility aid users.

**(12) Use by standees.** Lifts shall accommodate persons using walkers, crutches, canes or braces or who otherwise have difficulty using steps. The platform may be marked to indicate a preferred standing position.

**(13) Handrails.** Platforms on lifts shall be equipped with handrails on two sides, which move in tandem with the lift, and which shall be graspable and provide support to standees throughout the entire lift operation. Handrails shall have a usable component at least 8 inches long with the lowest portion a minimum 30 inches above the platform and the highest portion a maximum 38 inches above the platform. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the

handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than ¼ inch. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

**(c) Vehicle ramp—(1) Design load.** Ramps 30 inches or longer shall support a load of 600 pounds, placed at the centroid of the ramp distributed over an area of 26 inches by 26 inches, with a safety factor of at least 3 based on the ultimate strength of the material. Ramps shorter than 30 inches shall support a load of 300 pounds.

**(2) Ramp surface.** The ramp surface shall be continuous and slip resistant; shall not have protrusions from the surface greater than ¼ inch high; shall have a clear width of 30 inches; and shall accommodate both four-wheel and three-wheel mobility aids.

**(3) Ramp threshold.** The transition from roadway or sidewalk and the transition from vehicle floor to the ramp may be vertical without edge treatment up to ¼ inch. Changes in level between ¼ inch and ½ inch shall be beveled with a slope no greater than 1:2.

**(4) Ramp barriers.** Each side of the ramp shall have barriers at least 2 inches high to prevent mobility aid wheels from slipping off.

**(5) Slope.** Ramps shall have the least slope practicable and shall not exceed 1:4 when deployed to ground level. If the height of the vehicle floor from which the ramp is deployed is 3 inches or less above a 6-inch curb, a maximum slope of 1:4 is permitted; if the height of the vehicle floor from which the ramp is deployed is 6 inches or less, but greater than 3 inches, above a 6-inch curb, a maximum slope of 1:6 is permitted; if the height of the vehicle floor from which the ramp is deployed is 9 inches or less, but greater than 6 inches, above a 6-inch curb, a maximum slope of 1:8 is permitted; if the height of the vehicle floor from which the ramp is deployed is greater than 9 inches above a 6-inch curb, a slope of 1:12 shall be achieved. Folding or telescoping ramps are permitted provided they meet all structural requirements of this section.

**(6) Attachment.** When in use for boarding or alighting, the ramp shall be firmly attached to the vehicle so that it is not subject to displacement when loading or unloading a heavy power

mobility aid and that no gap between vehicle and ramp exceeds  $\frac{1}{4}$  inch.

(7) *Stowage.* A compartment, securement system, or other appropriate method shall be provided to ensure that stowed ramps, including portable ramps stowed in the passenger area, do not impinge on a passenger's wheelchair or mobility aid or pose any hazard to passengers in the event of a sudden stop or maneuver.

(8) *Handrails.* If provided, handrails shall allow persons with disabilities to grasp them from outside the vehicle while starting to board, and to continue to use them throughout the boarding process, and shall have the top between 30 inches and 38 inches above the ramp surface. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between  $\frac{1}{4}$  inches and  $\frac{1}{2}$  inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than  $\frac{1}{8}$  inch. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

(d) *Securement devices—(1) Design load.* Securement systems on vehicles with GVWRs of 30,000 pounds or above, and their attachments to such vehicles, shall restrain a force in the forward longitudinal direction of up to 2,000 pounds per securement leg or clamping mechanism and a minimum of 4,000 pounds for each mobility aid.

Securement systems on vehicles with GVWRs of up to 30,000 pounds, and their attachments to such vehicles, shall restrain a force in the forward longitudinal direction of up to 2,500 pounds per securement leg or clamping mechanism and a minimum of 5,000 pounds for each mobility aid.

(2) *Location and size.* The securement system shall be placed as near to the accessible entrance as practicable and shall have a clear floor area of 30 inches by 48 inches. Such space shall adjoin, and may overlap, an access path. Not more than 6 inches of the required clear floor space may be accommodated for footrests under another seat provided there is a minimum of 9 inches from the floor to the lowest part of the seat overhanging the space. Securement areas may have fold-down seats to accommodate other passengers when a wheelchair or mobility aid is not occupying the area, provided the seats, when folded up, do not obstruct the clear floor space required. (See Fig. 2)

(3) *Mobility aids accommodated.* The securement system shall secure common

wheelchairs and mobility aids and shall either be automatic or easily attached by a person familiar with the system and mobility aid and having average dexterity.

(4) *Orientation.* In vehicles in excess of 22 feet in length, at least one securement device or system required by paragraph (a) of this section shall secure the wheelchair or mobility aid facing toward the front of the vehicle. Additional securement devices or systems shall secure the wheelchair or mobility aid facing forward, or rearward with a padded barrier, extending from a height of 38 inches from the vehicle floor to a height of 56 inches from the vehicle floor with a width of 18 inches, laterally centered immediately in back of the seated individual. In vehicles 22 feet in length or less, the required securement device may secure the wheelchair or mobility aid either facing toward the front of the vehicle or facing rearward, with a padded barrier as described. Additional securement locations shall be either forward of rearward facing with a padded barrier. Such barriers need not be solid provided equivalent protection is afforded.

(5) *Movement.* When the wheelchair or mobility aid is secured in accordance with manufacturer's instructions, the securement system shall limit the movement of an occupied wheelchair or mobility aid to no more than 2 inches in any direction under normal vehicle operating conditions.

(6) *Stowage.* When not being used for securement, or when the securement area can be used by standees, the securement system shall not interfere with passenger movement, shall not present any hazardous condition, shall be reasonably protected from vandalism, and shall be readily accessed when needed for use.

(7) *Seat belt and shoulder harness.* For each wheelchair or mobility aid securement device provided, a passenger seat belt and shoulder harness, complying with all applicable provisions of part 571 of this title, shall also be provided for use by wheelchair or mobility aid users. Such seat belts and shoulder harnesses shall not be used in lieu of a device which secures the wheelchair or mobility aid itself.

#### § 38.25 Doors, steps and thresholds.

(a) *Slip resistance.* All aisles, steps, floor areas where people walk and floors in securement locations shall have slip-resistant surfaces.

(b) *Contrast.* All step edges, thresholds and the boarding edge of ramps or lift platforms shall have a band of color(s) running the full width of the step or edge which contrasts from the

step tread and riser, or lift or ramp surface, either light-on-dark or dark-on-light.

(c) *Door height.* For vehicles in excess of 22 feet in length, the overhead clearance between the top of the door opening and the raised lift platform, or highest point of a ramp, shall be a minimum of 68 inches. For vehicles of 22 feet in length or less, the overhead clearance between the top of the door opening and the raised lift platform, or highest point of a ramp, shall be a minimum of 56 inches.

#### § 38.27 Priority seating signs.

(a) Each vehicle shall contain sign(s) which indicate that seats in the front of the vehicle are priority seats for persons with disabilities, and that other passengers should make such seats available to those who wish to use them. At least one set of forward-facing seats shall be so designated.

(b) Each securement location shall have a sign designating it as such.

(c) Characters on signs required by paragraphs (a) and (b) of this section shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case "X") of  $\frac{1}{8}$  inch, with "wide" spacing (generally, the space between letters shall be  $\frac{1}{16}$  the height of upper case letters), and shall contrast with the background either light-on-dark or dark-on-light.

#### § 38.29 Interior circulation, handrails and stanchions.

(a) Interior handrails and stanchions shall permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a securement location from the lift or ramp.

(b) Handrails and stanchions shall be provided in the entrance to the vehicle in a configuration which allows persons with disabilities to grasp such assists from outside the vehicle while starting to board, and to continue using such assists throughout the boarding and fare collection process. Handrails shall have a cross-sectional diameter between  $\frac{1}{4}$  inches and  $\frac{1}{2}$  inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than  $\frac{1}{8}$  inch. Handrails shall be placed to provide a minimum  $1\frac{1}{2}$  inches knuckle clearance from the nearest adjacent surface. Where on-board fare collection devices are used on vehicles in excess of 22 feet in length, a horizontal passenger assist shall be located across the front of the vehicle and shall prevent passengers from



sustaining injuries on the fare collection device or windshield in the event of a sudden deceleration. Without restricting the vestibule space, the assist shall provide support for a boarding passenger from the front door through the boarding procedure. Passengers shall be able to lean against the assist for security while paying fares.

(c) For vehicles in excess of 22 feet in length, overhead handrail(s) shall be provided which shall be continuous except for a gap at the rear doorway.

(d) Handrails and stanchions shall be sufficient to permit safe boarding, on-board circulation, seating and standing assistance, and alighting by persons with disabilities.

(e) For vehicles in excess of 22 feet in length with front-door lifts or ramps, vertical stanchions immediately behind the driver shall either terminate at the lower edge of the aisle-facing seats, if applicable, or be "dog-legged" so that the floor attachment does not impede or interfere with wheelchair footrests. If the driver seat platform must be passed by a wheelchair or mobility aid user entering the vehicle, the platform, to the maximum extent practicable, shall not extend into the aisle or vestibule beyond the wheel housing.

(f) For vehicles in excess of 22 feet in length, the minimum interior height along the path from the lift to the securement location shall be 68 inches. For vehicles of 22 feet in length or less, the minimum interior height from lift to securement location shall be 56 inches.

#### § 38.31 Lighting.

(a) Any stepwell or doorway immediately adjacent to the driver shall have, when the door is open, at least 2 foot-candles of illumination measured on the step tread or lift platform.

(b) Other stepwells and doorways, including doorways in which lifts or ramps are installed, shall have, at all times, at least 2 foot-candles of illumination measured on the step tread, or lift or ramp, when deployed at the vehicle floor level.

(c) The vehicle doorways, including doorways in which lifts or ramps are installed, shall have outside light(s) which, when the door is open, provide at least 1 foot-candle of illumination on the street surface for a distance of 3 feet perpendicular to all points on the bottom step tread outer edge. Such light(s) shall be located below window level and shielded to protect the eyes of entering and existing passengers.

#### § 38.33 Fare box.

Where provided, the farebox shall be located as far forward as practicable and shall not obstruct traffic in the

vestibule, especially wheelchairs or mobility aids.

#### § 38.35 Public information system.

(a) Vehicles in excess of 22 feet in length, used in multiple-stop, fixed-route service, shall be equipped with a public address system permitting the driver, or recorded or digitized human speech messages, to announce stops and provide other passenger information within the vehicle.

(b) [Reserved]

#### § 38.37 Stop request.

(a) Where passengers may board or alight at multiple stops at their option, vehicles in excess of 22 feet in length shall provide controls adjacent to the securement location for requesting stops and which alerts the driver that a mobility aid user wishes to disembark. Such a system shall provide auditory and visual indications that the request has been made.

(b) Controls required by paragraph (a) of this section shall be mounted no higher than 48 inches and no lower than 15 inches above the floor, shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N).

#### § 38.39 Destination and route signs.

(a) Where destination or route information is displayed on the exterior of a vehicle, each vehicle shall have illuminated signs on the front and boarding side of the vehicle.

(b) Characters on signs required by paragraph (a) of this section shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case "X") of 1 inch for signs on the boarding side and a minimum character height of 2 inches for front "headsigs", with "wide" spacing (generally, the space between letters shall be 1/16 the height of upper case letters), and shall contrast with the background, either dark-on-light or light-on-dark.

### Subpart C—Rapid Rail Vehicles and Systems

#### § 38.51 General.

(a) New, used and remanufactured rapid rail vehicles, to be considered accessible by regulations in part 37 of this title, shall comply with this subpart.

(b) If portions of the vehicle are modified in a way that affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require

that inaccessible vehicles be retrofitted with lifts, ramps or other boarding devices.

(c) Existing vehicles which are retrofitted to comply with the "one-car-per-train rule" of § 37.93 of this title shall comply with §§ 38.55, 38.57(b), 38.59 of this part and shall have, in new and key stations, at least one door complying with §§ 38.53 (a)(1), (b) and (d) of this part. Removal of seats is not required. Vehicles previously designed and manufactured in accordance with the accessibility requirements of part 609 of this title or the Secretary of Transportation regulations implementing section 504 of the Rehabilitation Act of 1973 that were in effect before October 7, 1991, and which can be entered and used from stations in which they are to be operated, may be used to satisfy the requirements of § 37.93 of this title.

#### § 38.53 Doorways.

(a) *Clear width.* (1) Passenger doorways on vehicle sides shall have clear openings at least 32 inches wide when open.

(2) If doorways connecting adjoining cars in a multi-car train are provided, and if such doorway is connected by an aisle with a minimum clear width of 30 inches to one or more spaces where wheelchair or mobility aid users can be accommodated, then such doorway shall have a minimum clear opening of 30 inches to permit wheelchair and mobility aid users to be evacuated to an adjoining vehicle in an emergency.

(b) *Signage.* The International Symbol of Accessibility shall be displayed on the exterior of accessible vehicles operating on an accessible rapid rail system unless all vehicles are accessible and are not marked by the access symbol. (See Fig. 6.)

(c) *Signals.* Auditory and visual warning signals shall be provided to alert passengers of closing doors.

(d) *Coordination with boarding platform.*—(1) *Requirements.* Where new vehicles will operate in new stations, the design of vehicles shall be coordinated with the boarding platform design such that the horizontal gap between each vehicle door at rest and the platform shall be no greater than 3 inches and the height of the vehicle floor shall be within plus or minus ¾ inch of the platform height under all normal passenger load conditions. Vertical alignment may be accomplished by vehicle air suspension or other suitable means of meeting the requirement.

(2) *Exception.* New vehicles operating in existing stations may have a floor height within plus or minus 1½ inches of

the platform height. At key stations, the horizontal gap between at least one door of each such vehicle and the platform shall be no greater than 3 inches.

(3) *Exception.* Retrofitted vehicles shall be coordinated with the platform in new and key stations such that the horizontal gap shall be no greater than 4 inches and the height of the vehicle floor, under 50% passenger load, shall be within plus or minus 2 inches of the platform height.

#### **§ 38.55 Priority seating signs.**

(a) Each vehicle shall contain sign(s) which indicate that certain seats are priority seats for persons with disabilities, and that other passengers should make such seats available to those who wish to use them.

(b) Characters on signs required by paragraph (a) of this section shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case "X") of  $\frac{3}{16}$  inch, with "wide" spacing (generally, the space between letters shall be  $\frac{1}{16}$  the height of upper case letters), and shall contrast with the background, either light-on-dark or dark-on-light.

#### **§ 38.57 Interior circulation, handrails and stanchions.**

(a) Handrails and stanchions shall be provided to assist safe boarding, on-board circulation, seating and standing assistance, and alighting by persons with disabilities.

(b) Handrails, stanchions, and seats shall allow a route at least 32 inches wide so that at least two wheelchair or mobility aid users can enter the vehicle and position the wheelchairs or mobility aids in areas, each having a minimum clear space of 48 inches by 30 inches, which do not unduly restrict movement of other passengers. Space to accommodate wheelchairs and mobility aids may be provided within the normal area used by standees and designation of specific spaces is not required. Particular attention shall be given to ensuring maximum maneuverability immediately inside doors. Ample vertical stanchions from ceiling to seat-back rails shall be provided. Vertical stanchions from ceiling to floor shall not interfere with wheelchair or mobility aid user circulation and shall be kept to a minimum in the vicinity of doors.

(c) The diameter or width of the gripping surface of handrails and stanchions shall be  $\frac{1}{4}$  inches to  $\frac{1}{2}$  inches or provide an equivalent gripping surface and shall provide a minimum

$\frac{1}{2}$  inches knuckle clearance from the nearest adjacent surface.

#### **§ 38.59 Floor surfaces.**

Floor surfaces on aisles, places for standees, and areas where wheelchair and mobility aid users are to be accommodated shall be slip-resistant.

#### **§ 38.61 Public information system.**

(a)(1) *Requirements.* Each vehicle shall be equipped with a public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted. Each vehicle operating in stations having more than one line or route shall have an external public address system to permit transportation system personnel, or recorded or digitized human speech messages, to announce train, route, or line identification information.

(2) *Exception.* Where station announcement systems provide information on arriving trains, an external train speaker is not required.

(b) [Reserved].

#### **§ 38.63 Between-car barriers.**

(a) *Requirement.* Suitable devices or systems shall be provided to prevent, deter or warn individuals from inadvertently stepping off the platform between cars. Acceptable solutions include, but are not limited to, pantograph gates, chains, motion detectors or similar devices.

(b) *Exception.* Between-car barriers are not required where platform screens are provided which close off the platform edge and open only when trains are correctly aligned with the doors.

### **Subpart D—Light Rail Vehicles and Systems**

#### **§ 38.71 General.**

(a) New, used and remanufactured light rail vehicles, to be considered accessible by regulations in part 37 of this title shall comply with this subpart.

(b)(1) Vehicles intended to be operated solely in light rail systems confined entirely to a dedicated right-of-way, and for which all stations or stops are designed and constructed for revenue service after the effective date of standards for design and construction in § 37.21 and § 37.23 of this title shall provide level boarding and shall comply with § 38.73(d)(1) and § 38.85 of this part.

(2) Vehicles designed for, and operated on, pedestrian malls, city streets, or other areas where level

boarding is not practicable shall provide wayside or car-borne lifts, mini-high platforms, or other means of access in compliance with § 38.83 (b) or (c) of this part.

(c) If portions of the vehicle are modified in a way that affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible vehicles be retrofitted with lifts, ramps or other boarding devices.

(d) Existing vehicles retrofitted to comply with the "one-car-per-train rule" at § 37.93 of this title shall comply with § 38.75, § 38.77(c), § 38.79(a) and § 38.83(a) of this part and shall have, in new and key stations, at least one door which complies with § 38.73 (a)(1), (b) and (d) of this part. Vehicles previously designed and manufactured in accordance with the accessibility requirements of part 609 of this title or the Secretary of Transportation regulations implementing section 504 of the Rehabilitation Act of 1973 that were in effect before October 7, 1991, and which can be entered and used from stations in which they are to be operated, may be used to satisfy the requirements of § 37.93 of this title.

#### **§ 38.73 Doorways.**

(a) *Clear width.*—(1) All passenger doorways on vehicle sides shall have minimum clear openings of 32 inches when open.

(2) If doorways connecting adjoining cars in a multi-car train are provided, and if such doorway is connected by an aisle with a minimum clear width of 30 inches to one or more spaces where wheelchair or mobility aid users can be accommodated, then such doorway shall have a minimum clear opening of 30 inches to permit wheelchair and mobility aid users to be evacuated to an adjoining vehicle in an emergency.

(b) *Signage.* The International Symbol of Accessibility shall be displayed on the exterior of each vehicle operating on an accessible light rail system unless all vehicles are accessible and are not marked by the access symbol (see fig. 6).

(c) *Signals.* Auditory and visual warning signals shall be provided to alert passengers of closing doors.

(d) *Coordination with boarding platform.*—(1) *Requirements.* The design of level-entry vehicles shall be coordinated with the boarding platform or mini-high platform design so that the horizontal gap between a vehicle at rest and the platform shall be no greater than 3 inches and the height of the vehicle floor shall be within plus or

minus  $\frac{1}{8}$  inch of the platform height. Vertical alignment may be accomplished by vehicle air suspension, automatic ramps or lifts, or any combination.

(2) *Exception.* New vehicles operating in existing stations may have a floor height within plus or minus  $1\frac{1}{2}$  inches of the platform height. At key stations, the horizontal gap between at least one door of each such vehicle and the platform shall be no greater than 3 inches.

(3) *Exception.* Retrofitting vehicles shall be coordinated with the platform in new and key stations such that the horizontal gap shall be no greater than 4 inches and the height of the vehicle floor, under 50% passenger load, shall be within plus or minus 2 inches of the platform height.

(4) *Exception.* Where it is not operationally or structurally practicable to meet the horizontal or vertical requirements of paragraphs (d) (1), (2) or (3) of this section, platform or vehicle devices complying with § 38.83(b) or platform or vehicle mounted ramps or bridge plates complying with § 38.83(c) shall be provided.

#### § 38.75 Priority seating signs.

(a) Each vehicle shall contain sign(s) which indicate that certain seats are priority seats for persons with disabilities, and that other passengers should make such seats available to those who wish to use them.

(b) Where designated wheelchair or mobility aid seating locations are provided, signs shall indicate the location and advise other passengers of the need to permit wheelchair and mobility aid users to occupy them.

(c) Characters on signs required by paragraphs (a) or (b) of this section shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case "X") of  $\frac{1}{8}$  inch, with "wide" spacing (generally, the space between letters shall be  $\frac{1}{16}$  the height of upper case letters), and shall contrast with the background, either light-on-dark or dark-on-light.

#### § 38.77 Interior circulation, handrails and stanchions.

(a) Handrails and stanchions shall be sufficient to permit safe boarding, on-board circulation, seating and standing assistance, and alighting by persons with disabilities.

(b) At entrances equipped with steps, handrails and stanchions shall be provided in the entrance to the vehicle in a configuration which allows passengers to grasp such assists from outside the vehicle while starting to

board, and to continue using such handrails or stanchions throughout the boarding process. Handrails shall have a cross-sectional diameter between  $1\frac{1}{4}$  inches and  $1\frac{1}{2}$  inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than  $\frac{1}{8}$  inch. Handrails shall be placed to provide a minimum  $1\frac{1}{2}$  inches knuckle clearance from the nearest adjacent surface. Where on-board fare collection devices are used, a horizontal passenger assist shall be located between boarding passengers and the fare collection device and shall prevent passengers from sustaining injuries on the fare collection device or windshield in the event of a sudden deceleration. Without restricting the vestibule space, the assist shall provide support for a boarding passenger from the door through the boarding procedure. Passengers shall be able to lean against the assist for security while paying fares.

(c) At all doors on level-entry vehicles, and at each entrance accessible by lift, ramp, bridge plate or other suitable means, handrails, stanchions, passenger seats, vehicle driver seat platforms, and fare boxes, if applicable, shall be located so as to allow a route at least 32 inches wide so that at least two wheelchair or mobility aid users can enter the vehicle and position the wheelchairs or mobility aids in areas, each having a minimum clear space of 48 inches by 30 inches, which do not unduly restrict movement of other passengers. Space to accommodate wheelchairs and mobility aids may be provided within the normal area used by standees and designation of specific spaces is not required. Particular attention shall be given to ensuring maximum maneuverability immediately inside doors. Ample vertical stanchions from ceiling to seat-back rails shall be provided. Vertical stanchions from ceiling to floor shall not interfere with wheelchair or mobility aid circulation and shall be kept to a minimum in the vicinity of accessible doors.

#### § 38.79 Floors, steps and thresholds.

(a) Floor surfaces on aisles, step treads, places for standees, and areas where wheelchair and mobility aid users are to be accommodated shall be slip-resistant.

(b) All thresholds and step edges shall have a band of color(s) running the full width of the step or threshold which contrasts from the step tread and riser or adjacent floor, either light-on-dark or dark-on-light.

#### § 38.81 Lighting.

(a) Any stepwell or doorway with a lift, ramp or bridge plate immediately adjacent to the driver shall have, when the door is open, at least 2 foot-candles of illumination measured on the step tread or lift platform.

(b) Other stepwells, and doorways with lifts, ramps or bridge plates, shall have, at all times, at least 2 foot-candles of illumination measured on the step tread or lift or ramp, when deployed at the vehicle floor level.

(c) The doorways of vehicles not operating at lighted station platforms shall have outside lights which provide at least 1 foot-candle of illumination on the station platform or street surface for a distance of 3 feet perpendicular to all points on the bottom step tread. Such lights shall be located below window level and shielded to protect the eyes of entering and exiting passengers.

#### § 38.83 Mobility aid accessibility.

(a)(1) *General.* All new light rail vehicles, other than level entry vehicles, covered by this subpart shall provide a level-change mechanism or boarding device (e.g., lift, ramp or bridge plate) complying with either paragraph (b) or (c) of this section and sufficient clearances to permit at least two wheelchair or mobility aid users to reach areas, each with a minimum clear floor space of 48 inches by 30 inches, which do not unduly restrict passenger flow. Space to accommodate wheelchairs and mobility aids may be provided within the normal area used by standees and designation of specific spaces is not required.

(2) *Exception.* If lifts, ramps or bridge plates meeting the requirements of this section are provided on station platforms or other stops required to be accessible, or mini-high platforms complying with § 38.73(d) of this part are provided, the vehicle is not required to be equipped with a car-borne device. Where each new vehicle is compatible with a single platform-mounted access system or device, additional systems or devices are not required for each vehicle provided that the single device could be used to provide access to each new vehicle if passengers using wheelchairs or mobility aids could not be accommodated on a single vehicle.

(b) *Vehicle lift—(1) Design load.* The design load of the lift shall be at least 600 pounds. Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Nonworking parts, such as



platform, frame, and attachment hardware which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material.

(2) *Controls*—(i) *Requirements*. The controls shall be interlocked with the vehicle brakes, propulsion system, or door, or shall provide other appropriate mechanisms or systems, to ensure that the vehicle cannot be moved when the lift is not stowed and so the lift cannot be deployed unless the interlocks or systems are engaged. The lift shall deploy to all levels (i.e., ground, curb, and intermediate positions) normally encountered in the operating environment. Where provided, each control for deploying, lowering, raising, and stowing the lift and lowering the roll-off barrier shall be of a momentary contact type requiring continuous manual pressure by the operator and shall not allow improper lift sequencing when the lift platform is occupied. The controls shall allow reversal of the lift operation sequence, such as raising or lowering a platform that is part way down, without allowing an occupied platform to fold or retract into the stowed position.

(ii) *Exception*. Where physical or safety constraints prevent the deployment at some steps of a lift having its long dimension perpendicular to the vehicle axis, the transportation entity may specify a lift which is designed to deploy with its long dimension parallel to the vehicle axis and which pivots into or out of the vehicle while occupied (i.e., "rotary lift"). The requirements of paragraph (b)(2)(i) of this section prohibiting the lift from being stowed while occupied shall not apply to a lift design of this type if the stowed position is within the passenger compartment and the lift is intended to be stowed while occupied.

(iii) *Exception*. The brake or propulsion system interlocks requirement does not apply to a station platform mounted lift provided that a mechanical, electrical or other system operates to ensure that vehicles do not move when the lift is in use.

(3) *Emergency operation*. The lift shall incorporate an emergency method of deploying, lowering to ground level with a lift occupant, and raising and stowing the empty lift if the power to the lift fails. No emergency method, manual or otherwise, shall be capable of being operated in a manner that could be hazardous to the lift occupant or to the operator when operated according to manufacturer's instructions, and shall not permit the platform to be stowed or folded when occupied, unless the lift is a

rotary lift intended to be stowed while occupied.

(4) *Power or equipment failure*. Lift platforms stowed in a vertical position, and deployed platforms when occupied, shall have provisions to prevent their deploying, failing, or folding any faster than 12 inches/second or their dropping of an occupant in the event of a single failure of any load carrying component.

(5) *Platform barriers*. The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair or mobility aid from rolling off the lift during its operation. A movable barrier or inherent design feature shall prevent a wheelchair or mobility aid from rolling off the edge closest to the vehicle until the lift is in its fully raised position. Each side of the lift platform which extends beyond the vehicle in its raised position shall have a barrier a minimum 1½ inches high. Such barriers shall not interfere with maneuvering into or out of the aisle. The loading-edge barrier (outer barrier) which functions as a loading ramp when the lift is at ground level, shall be sufficient when raised or closed, or a supplementary system shall be provided, to prevent a power wheelchair or mobility aid from riding over or defeating it. The outer barrier on the outboard of the lift shall automatically rise or close, or a supplementary system shall automatically engage, and remain raised, closed, or engaged at all times that the lift is more than 3 inches above the station platform or roadway and the lift is occupied. Alternatively, a barrier or system may be raised, lowered, opened, closed, engaged or disengaged by the lift operator provided an interlock or inherent design feature prevents the lift from rising unless the barrier is raised or closed or the supplementary system is engaged.

(6) *Platform surface*. The lift platform surface shall be free of any protrusions over ¼ inch high and shall be slip resistant. The lift platform shall have a minimum clear width of 28½ inches at the platform, a minimum clear width of 30 inches measured from 2 inches above the lift platform surface to 30 inches above the surface, and a minimum clear length of 48 inches measured from 2 inches above the surface of the platform to 30 inches above the surface. (See Fig. 1)

(7) *Platform gaps*. Any openings between the lift platform surface and the raised barriers shall not exceed ¾ inch wide. When the lift is at vehicle floor height with the inner barrier (if applicable) down or retracted, gaps between the forward lift platform edge and vehicle floor shall not exceed ½

inch horizontally and ¾ inch vertically. Platforms on semi-automatic lifts may have a hand hold not exceeding 1½ inches by 4½ inches located between the edge barriers.

(8) *Platform entrance ramp*. The entrance ramp, or loading-edge barrier used as a ramp, shall not exceed a slope of 1:8 measured on level ground, for a maximum rise of 3 inches, and the transition from the station platform or roadway to ramp may be vertical without edge treatment up to ¼ inch. Thresholds between ¼ inch and ½ inch high shall be beveled with a slope no greater than 1:2.

(9) *Platform deflection*. The lift platform (not including the entrance ramp) shall not deflect more than 3 degrees (exclusive of vehicle roll) in any direction between its unloaded position and its position when loaded with 600 pounds applied through a 26 inch by 26 inch test pallet at the centroid of the lift platform.

(10) *Platform movement*. No part of the platform shall move at a rate exceeding 6 inches/second during lowering and lifting an occupant, and shall not exceed 12 inches/second during deploying or stowing. This requirement does not apply to the deployment or stowage cycles of lifts that are manually deployed or stowed. The maximum platform horizontal and vertical acceleration when occupied shall be 0.3g.

(11) *Boarding direction*. The lift shall permit both inboard and outboard facing of wheelchairs and mobility aids.

(12) *Use by standees*. Lifts shall accommodate persons using walkers, crutches, canes or braces or who otherwise have difficulty using steps. The lift may be marked to indicate a preferred standing position.

(13) *Handrails*. Platforms on lifts shall be equipped with handrails, on two sides, which move in tandem with the lift which shall be graspable and provide support to standees throughout the entire lift operation. Handrails shall have a usable component at least 8 inches long with the lowest portion a minimum 30 inches above the platform and the highest portion a maximum 38 inches above the platform. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. Handrails shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than ¾ inch. Handrails shall be placed to



provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

(c) *Vehicle ramp or bridge plate.*—(1) *Design load.* Ramps or bridge plates 30 inches or longer shall support a load of 600 pounds, placed at the centroid of the ramp or bridge plate distributed over an area of 26 inches, with a safety factor of at least 3 based on the ultimate strength of the material. Ramps or bridge plates shorter than 30 inches shall support a load of 300 pounds.

(2) *Ramp surface.* The ramp or bridge plate surface shall be continuous and slip resistant, shall not have protrusions from the surface greater than ¼ inch, shall have a clear width of 30 inches, and shall accommodate both four-wheel and three-wheel mobility aids.

(3) *Ramp threshold.* The transition from roadway or station platform and the transition from vehicle floor to the ramp or bridge plate may be vertical without edge treatment up to ¼ inch. Changes in level between ¼ inch and ½ inch shall be beveled with a slope no greater than 1:2.

(4) *Ramp barriers.* Each side of the ramp or bridge plate shall have barriers at least 2 inches high to prevent mobility aid wheels from slipping off.

(5) *Slope.* Ramps or bridge plates shall have the least slope practicable. If the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 3 inches or less above the station platform a maximum slope of 1:4 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 6 inches or less, but more than 3 inches, above the station platform a maximum slope of 1:6 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 9 inches or less, but more than 6 inches, above the station platform a maximum slope of 1:8 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is greater than 9 inches above the station platform a slope of 1:12 shall be achieved. Folding or telescoping ramps are permitted provided they meet all structural requirements of this section.

(6) *Attachment*—(i) *Requirement.* When in use for boarding or alighting, the ramp or bridge plate shall be attached to the vehicle, or otherwise prevented from moving such that it is not subject to displacement when loading or unloading a heavy power mobility aid and that any gaps between vehicle and ramp or bridge plate, and

station platform and ramp or bridge plate, shall not exceed ¾ inch.

(ii) *Exception.* Ramps or bridge plates which are attached to, and deployed from, station platforms are permitted in lieu of vehicle devices provided they meet the displacement requirements of paragraph (c)(6)(i) of this section.

(7) *Stowage.* A compartment, securement system, or other appropriate method shall be provided to ensure that stowed ramps or bridge plates, including portable ramps or bridges stowed in the passenger area, do not impinge on a passenger's wheelchair or mobility aid or pose any hazard to passengers in the event of a sudden stop.

(8) *Handrails.* If provided, handrails shall allow persons with disabilities to grasp them from outside the vehicle while starting to board, and to continue to use them throughout the boarding process, and shall have the top between 30 inches and 38 inches above the ramp surface. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have "eased" edges with corner radii of not less than ¼ inch. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

#### § 38.85 Between-car barriers.

Where vehicles operate in a high-platform, level-boarding mode, devices or systems shall be provided to prevent, deter or warn individuals from inadvertently stepping off the platform between cars. Appropriate devices include, but are not limited to, pantograph gates, chains, motion detectors or other suitable devices.

#### § 38.87 Public information system.

(a) Each vehicle shall be equipped with an interior public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted.

(b) [Reserved]

### Subpart E—Commuter Rail Cars and Systems

#### § 38.91 General.

(a) New, used and remanufactured commuter rail cars, to be considered

accessible by regulations in part 37 of this title, shall comply with this subpart.

(b) If portions of the car are modified in such a way that it affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible cars be retrofitted with lifts, ramps or other boarding devices.

(c)(1) Commuter rail cars shall comply with §§ 38.93(d) and 38.109 of this part for level boarding wherever structurally and operationally practicable.

(2) Where level boarding is not structurally or operationally practicable, commuter rail cars shall comply § 38.95 of this part.

(d) Existing vehicles retrofitted to comply with the "one-car-per-train rule" at § 37.93 of this title shall comply with §§ 38.93(e), 38.95(a) and 38.107 of this part and shall have, in new and key stations at least one door on each side from which passengers board which complies with § 38.93(d) of this part. Vehicles previously designed and manufactured in accordance with the program accessibility requirements of section 504 of the Rehabilitation Act of 1973, or implementing regulations of the Secretary of Transportation that were in effect before October 7, 1991; and which can be entered and used from stations in which they are to be operated, may be used to satisfy the requirements of § 37.93 of this title.

#### § 38.93 Doorways.

(a) *Clear width.* (1) At least one door on each side of the car from which passengers board opening onto station platforms and at least one adjacent doorway into the passenger coach compartment, if provided, shall have a minimum clear opening of 32 inches.

(2) If doorways connecting adjoining cars in a multi-car train are provided, and if such doorway is connected by an aisle with a minimum clear width of 30 inches to one or more spaces where wheelchair or mobility aid users can be accommodated, then such doorway shall have, to the maximum extent practicable in accordance with the regulations issued under the Federal Railroad Safety Act of 1970 (49 CFR parts 229 and 231), a clear opening of 30 inches.

(b) *Passageways.* A route at least 32 inches wide shall be provided from doors required to be accessible by paragraph (a)(1) of this section to seating locations complying with § 38.95(d) of this part. In cars where such doorways require passage through a vestibule, such vestibule shall have a minimum width of 42 inches. (See Fig. 3.)

(c) *Signals.* If doors to the platform close automatically or from a remote location, auditory and visual warning signals shall be provided to alert passengers or closing doors.

(d) *Coordination with boarding platform—(1) Requirements.* Cars operating in stations with high platforms, or mini-high platforms, shall be coordinated with the boarding platform design such that the horizontal gap between a car at rest and the platform shall be no greater than 3 inches and the height of the car floor shall be within plus or minus  $\frac{1}{2}$  inch of the platform height. Vertical alignment may be accomplished by car air suspension, platform lifts or other devices, or any combination.

(2) *Exception.* New vehicles operating in existing stations may have a floor height within plus or minus  $1\frac{1}{2}$  inches of the platform height. At key stations, the horizontal gap between at least one accessible door of each such vehicle and the platform shall be no greater than 3 inches.

(3) *Exception.* Where platform setbacks do not allow the horizontal gap or vertical alignment specified in paragraph (d)(1) or (d)(2) of this section, car, platform or portable lifts complying with § 38.95(b) of this part, or car or platform ramps or bridge plates, complying with § 38.95(c) of this part, shall be provided.

(4) *Exception.* Retrofitted vehicles shall be coordinated with the platform in new and key stations such that the horizontal gap shall be no greater than 4 inches and the height of the vehicle floor, under 50% passenger load, shall be within plus or minus 2 inches of the platform height.

(e) *Signage.* The International Symbol of Accessibility shall be displaced on the exterior of all doors complying with this section unless all cars are accessible and are not marked by the access symbol (see Fig. 6). Appropriate signage shall also indicate which accessible doors are adjacent to an accessible restroom, if applicable.

### § 38.95 Mobility aid accessibility.

(a)(1) *General.* All new commuter rail cars, other than level entry cars, covered by this subpart shall provide a level-change mechanism or boarding device (e.g., lift, ramp or bridge plate) complying with either paragraph (b) or (c) of this section; sufficient clearances to permit a wheelchair or mobility aid user to reach a seating location; and at least two wheelchair or mobility aid seating locations complying with paragraph (d) of this section.

(2) *Exception.* If portable or platform lifts, ramps or bridge plates meeting the

applicable requirements of this section are provided on station platforms or other stops required to be accessible, or mini-high platforms complying with § 38.93(d) are provided, the car is not required to be equipped with a car-borne device. Where each new car is compatible with a single platform-mounted access system or device, additional systems or devices are not required for each car provided that the single device could be used to provide access to each new car if passengers using wheelchairs or mobility aids could not be accommodated on a single car.

(b) *Car Lift—(1) Design load.* The design load of the lift shall be at least 600 pounds. Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Nonworking parts, such as platform, frame, and attachment hardware which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material.

(2) *Controls—(i) Requirements.* The controls shall be interlocked with the car brakes, propulsion system, or door, or shall provide other appropriate mechanisms or systems, to ensure that the car cannot be moved when the lift is not stowed and so the lift cannot be deployed unless the interlocks or systems are engaged. The lift shall deploy to all platform levels normally encountered in the operating environment. Where provided, each control for deploying, lowering, raising, and stowing the lift and lowering the roll-off barrier shall be of a monetary contact type requiring continuous manual pressure by the operator and shall not allow improper lift sequencing when the lift platform is occupied. The controls shall allow reversal of the lift operation sequence, such as raising or lowering a platform that is part way down, without allowing an occupied platform to fold or retract into the stowed position.

(ii) *Exception.* Where physical or safety constraints prevent the deployment at some stops of a lift having its long dimension perpendicular to the car axis, the transportation entity may specify a lift which is designed to deploy with its long dimension parallel to the car axis and which pivots into or out of the car while occupied (i.e., "rotary lift"). The requirements of paragraph (b)(2)(i) of this section prohibiting the lift from being stowed while occupied shall not apply to a lift design of this type if the stowed position is within the passenger compartment

and the lift is intended to be stowed while occupied.

(iii) *Exception.* The brake or propulsion system interlock requirement does not apply to a platform mounted or portable lift provided that a mechanical, electrical or other system operates to ensure that cars do not move when the lift is in use.

(3) *Emergency operation.* The lift shall incorporate an emergency method of deploying, lowering to ground or platform level with a lift occupant, and raising and stowing the empty lift if the power to the lift fails. No emergency method, manual or otherwise, shall be capable of being operated in a manner that could be hazardous to the lift occupant or to the operator when operated according to manufacturer's instructions, and shall not permit the platform to be stowed or folded when occupied, unless the lift is a rotary lift intended to be stowed while occupied.

(4) *Power or equipment failure.* Platforms stowed in a vertical position, and deployed platforms when occupied, shall have provisions to prevent their deploying, falling, or folding any faster than 12 inches/second or their dropping of an occupant in the event of a single failure of any load carrying component.

(5) *Platform barriers.* The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair or mobility aid from rolling off the lift during its operation. A movable barrier or inherent design feature shall prevent a wheelchair or mobility aid from rolling off the edge closest to the car until the lift is in its fully raised position. Each side of the lift platform which, in its raised position, extends beyond the car shall have a barrier a minimum  $1\frac{1}{2}$  inches high. Such barriers shall not interfere with maneuvering into or out of the car. The loading-edge barrier (outer barrier) which functions as a loading ramp when the lift is at ground or station platform level, shall be sufficient when raised or closed, or a supplementary system shall be provided, to prevent a power wheelchair or mobility aid from riding over or defeating it. The outer barrier of the lift shall automatically rise or close, or a supplementary system shall automatically engage, and remain raised, closed, or engaged at all times that the lift platform is more than 3 inches above the station platform and the lift is occupied. Alternatively, a barrier or system may be raised, lowered, opened, closed, engaged or disengaged by the lift operator provided an interlock or inherent design feature prevents the lift from rising unless the

barrier is raised or closed or the supplementary system is engaged.

(6) *Platform surface.* The lift platform surface shall be free of any protrusions over ¼ inch high and shall be slip resistant. The lift platform shall have a minimum clear width of 28½ inches at the platform, a minimum clear width of 30 inches measured from 2 inches above the lift platform surface to 30 inches above the surface, and a minimum clear length of 48 inches measured from 2 inches above the surface of the platform to 30 inches above the surface. (See Fig. 1)

(7) *Platform gaps.* Any openings between the lift platform surface and the raised barriers shall not exceed ¾ inch wide. When the lift is at car floor height with the inner barrier down (if applicable) or retracted, gaps between the forward lift platform edge and car floor shall not exceed ½ inch horizontally and ¾ inch vertically.

(8) *Platform entrance ramp.* The entrance ramp, or loading-edge barrier used as a ramp, shall not exceed a slope of 1:8, when measured on level ground, for a maximum rise of 3 inches, and the transition from station platform to ramp may be vertical without edge treatment up to ¼ inch. Thresholds between ¼ inch and ½ inch high shall be beveled with a slope no greater than 1:2.

(9) *Platform deflection.* The lift platform (not including the entrance ramp) shall not deflect more than 3 degrees (exclusive of vehicle roll) in any direction between its unloaded position and its position when loaded with 600 pounds applied through a 26 inch by 26 inch test pallet at the centroid of the lift platform.

(10) *Platform movement.* No part of the platform shall move at a rate exceeding 6 inches/second during lowering and lifting an occupant, and shall not exceed 12 inches/second during deploying or stowing. This requirement does not apply to the deployment or stowage cycles of lifts that are manually deployed or stowed. The maximum platform horizontal and vertical acceleration when occupied shall be 0.3g.

(11) *Boarding direction.* The lift shall permit both inboard and outboard facing of wheelchairs and mobility aids.

(12) *Use by standees.* Lifts shall accommodate persons using walkers, crutches, canes or braces or who otherwise have difficulty using steps. The lift may be marked to indicate a preferred standing position.

(13) *Handrails.* Platforms on lifts shall be equipped with handrails, on two sides, which move in tandem with the lift which shall be graspable and provide support to standees throughout

the entire lift operation. Handrails shall have a usable component at least 8 inches long with the lowest portion a minimum 30 inches above the platform and the highest portion a maximum 38 inches above the platform. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than ¼ inch. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the car.

(c) *Car ramp or bridge plate*—(1) *Design load.* Ramps or bridge plates 30 inches or longer shall support a load of 600 pounds, placed at the centroid of the ramp or bridge plate distributed over an area of 26 inches by 26 inches, with a safety factor of at least 3 based on the ultimate strength of the material. Ramps or bridge plates shorter than 30 inches shall support a load of 300 pounds.

(2) *Ramp surface.* The ramp or bridge plate surface shall be continuous and slip resistant, shall not have protrusions from the surface greater than ¼ inch high, shall have a clear width of 30 inches and shall accommodate both four-wheel and three-wheel mobility aids.

(3) *Ramp threshold.* The transition from station platform to the ramp or bridge plate and the transition from car floor to the ramp or bridge plate may be vertical without edge treatment up to ¼ inch. Changes in level between ¼ inch and ½ inch shall be beveled with a slope no greater than 1:2.

(4) *Ramp barriers.* Each side of the ramp or bridge plate shall have barriers at least 2 inches high to prevent mobility aid wheels from slipping off.

(5) *Slope.* Ramps or bridge plates shall have the least slope practicable. If the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 3 inches or less above the station platform a maximum slope of 1:4 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 6 inches or less, but more than 3 inches, above the station platform a maximum slope of 1:6 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 9 inches or less, but more than 6 inches, above the station platform a maximum

slope of 1:8 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is greater than 9 inches above the station platform a slope of 1:12 shall be achieved. Folding or telescoping ramps are permitted provided they meet all structural requirements of this section.

(6) *Attachment*—(i) *Requirement.* When in use for boarding or alighting, the ramp or bridge plate shall be attached to the vehicle, or otherwise prevented from moving such that it is not subject to displacement when loading or unloading a heavy power mobility aid and that any gaps between vehicle and ramp or bridge plate, and station platform and ramp or bridge plate, shall not exceed ¾ inch.

(ii) *Exception.* Ramps or bridge plates which are attached to, and deployed from, station platforms are permitted in lieu of car devices provided they meet the displacement requirements of paragraph (c)(6)(i) of this section.

(7) *Stowage.* A compartment, securement system, or other appropriate method shall be provided to ensure that stowed ramps or bridge plates, including portable ramps or bridge plates stowed in the passenger area, do not impinge on a passenger's wheelchair or mobility aid or pose any hazard to passengers in the event of a sudden stop.

(8) *Handrails.* If provided, handrails shall allow persons with disabilities to grasp them from outside the car while starting to board, and to continue to use them throughout the boarding process, and shall have the top between 30 inches and 38 inches above the ramp surface. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than ¼ inch. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the car.

(d) *Mobility aid seating location.* Spaces for persons who wish to remain in their wheelchairs or mobility aids shall have a minimum clear floor space 48 inches by 30 inches. Such spaces shall adjoin, and may overlap, an accessible path. Not more than 6 inches of the required clear floor space may be accommodated for footrests under another seat provided there is a minimum of 9 inches from the floor to the lowest part of the seat overhanging the space. Seating spaces may have



fold-down or removable seats to accommodate other passengers when a wheelchair or mobility aid user is not occupying the area, provided the seats, when folded up, do not obstruct the clear floor space required. (See Fig. 2.)

**§ 38.97 Interior circulation, handrails and stanchions.**

(a) Where provided, handrails or stanchions within the passenger compartment shall be placed to permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a seating location, complying with § 38.95(d) of this part, from an accessible entrance. The diameter or width of the gripping surface of interior handrails and stanchions shall be 1½ inches to 1½ inches or shall provide an equivalent gripping surface. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface.

(b) Where provided, handrails or stanchions shall be sufficient to permit safe boarding, on-board circulation, seating and standing assistance, and alighting by persons with disabilities.

(c) At entrances equipped with steps, handrails or stanchions shall be provided in the entrance to the car in a configuration which allows passengers to grasp such assists from outside the car while starting to board, and to continue using such assists throughout the boarding process, to the extent permitted by part 231 of this title.

**§ 38.99 Floors, steps and thresholds.**

(a) Floor surfaces on aisles, step treads, places for standees, and areas where wheelchair and mobility aid users are to be accommodated shall be slip-resistant.

(b) All thresholds and step edges shall have a band of color(s) running the full width of the step or threshold which contrasts from the step tread and riser or adjacent floor, either light-on-dark or dark-on-light.

**§ 38.101 Lighting**

(a) Any stepwell or doorway with a lift, ramp or bridge plate shall have, when the door is open, at least 2 footcandles of illumination measured on the step tread, ramp, bridge plate, or lift platform.

(b) The doorways of cars not operating at lighted station platforms shall have outside lights which, when the door is open, provide at least 1 footcandle of illumination on the station platform surface for a distance of 3 feet perpendicular to all points on the bottom step tread edge. Such lights shall

be shielded to protect the eyes of entering and exiting passengers.

**§ 38.103 Public information system.**

(a) Each car shall be equipped with an interior public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted.

(b) [Reserved]

**§ 38.105 Priority seating signs.**

(a) Each car shall contain sign(s) which indicate that certain seats are priority seats for persons with disabilities and that other passengers should make such seats available to those who wish to use them.

(b) Characters on signs required by paragraph (a) shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case "X") of ¾ inch, with "wide" spacing (generally, the space between letters shall be ¼ the height of upper case letters), and shall contrast with the background either light-on-dark or dark-on-light.

**§ 38.107 Restrooms.**

(a) If a restroom is provided for the general public, it shall be designed so as to allow a person using a wheelchair or mobility aid to enter and use such restroom as specified in paragraphs (a) (1) through (5) of this section.

(1) The minimum clear floor area shall be 35 inches by 60 inches. Permanently installed fixtures may overlap this area a maximum of 6 inches, if the lowest portion of the fixture is a minimum of 9 inches above the floor, and may overlap a maximum of 19 inches, if the lowest portion of the fixture is a minimum of 29 inches above the floor, provided such fixtures do not interfere with access to the water closet. Fold-down or retractable seats or shelves may overlap the clear floor space at a lower height provided they can be easily folded up or moved out of the way.

(2) The height of the water closet shall be 17 inches to 19 inches measured to the top of the toilet seat. Seats shall not be sprung to return to a lifted position.

(3) A grab bar at least 24 inches long shall be mounted behind the water closet, and a horizontal grab bar at least 40 inches long shall be mounted on at least one side wall, with one end not more than 12 inches from the back wall, at a height between 33 inches and 36 inches above the floor.

(4) Faucets and flush controls shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N). Controls for flush valves shall be mounted no more than 44 inches above the floor.

(5) Doorways on the end of the enclosure, opposite the water closet, shall have a minimum clear opening width of 32 inches. Doorways on the side wall shall have a minimum clear opening width of 39 inches. Door latches and hardware shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist.

(b) Restrooms required to be accessible shall be in close proximity to at least one seating location for persons using mobility aids and shall be connected to such a space by an unobstructed path having a minimum width of 32 inches.

**§ 38.109 Between-car barriers.**

Where vehicles operate in a high-platform, level-boarding mode, and where between-car bellows are not provided, devices or systems shall be provided to prevent, deter or warn individuals from inadvertently stepping off the platform between cars. Appropriate devices include, but are not limited to, pantograph gates, chains, motion detectors or other suitable devices.

**Subpart F—Intercity Rail Cars and Systems**

**§ 38.111 General.**

(a) New, used and remanufactured intercity rail cars, to be considered accessible by regulations in part 37 of this title shall comply with this subpart to the extent required for each type of car as specified below.

(1) Single-level rail passenger coaches and food service cars (other than single-level dining cars) shall comply with §§ 38.113 through 38.123 of this part. Compliance with § 38.125 of this part shall be required only to the extent necessary to meet the requirements of paragraph (d) of this section.

(2) Single-level dining and lounge cars shall have at least one connecting doorway complying with § 38.113(a)(2) of this part connected to a car accessible to persons using wheelchairs or mobility aids, and at least one space complying with §§ 38.125(d) (2) and (3) of this part, to provide table service to a person who wishes to remain in his or her wheelchair, and space to fold and

store a wheelchair for a person who wishes to transfer to an existing seat.

(3) Bi-level dining cars shall comply with §§ 38.113(a)(2), 38.115(b), 38.117(a), and 38.121 of this part.

(4) Bi-level lounge cars shall have doors on the lower level, on each side of the car from which passengers board, complying with § 38.113, a restroom complying with § 38.123, and at least one space complying with § 38.125(d) (2) and (3) to provide table service to a person who wishes to remain in his or her wheelchair and space to fold and store a wheelchair for a person who wishes to transfer to an existing seat.

(5) Restrooms, complying with § 38.123 shall be provided in single-level rail passenger coaches and food services cars adjacent to the accessible seating locations required by paragraph (d) of this section. Accessible restrooms are required in dining and lounge cars only if restrooms are provided for other passengers.

(6) Sleeper cars shall comply with §§ 38.113 (b) through (d), 38.115 through 38.121, and 38.125, of this part, and have at least one compartment which can be entered and used by a person using a wheelchair or mobility aid and complying with § 38.127 of this part.

(b)(1) If physically and operationally practicable, intercity rail cars shall comply with § 38.113(d) of this part for level boarding.

(2) Where level boarding is not structurally or operationally practicable, intercity rail cars shall comply with § 38.125.

(c) If portions of the car are modified in a way that it affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible cars be retrofitted with lifts, ramps or other boarding devices.

(d) Passenger coaches or food service cars shall have the number of spaces complying with § 38.125(d)(2) of this part and the number of spaces complying with § 38.125(d)(3) of this part, as required by § 37.91 of this title.

(e) Existing cars retrofitted to meet the seating requirements of § 37.91 of this title shall comply with § 38.113(e), § 38.123, § 38.125(d) of this part and shall have at least one door on each side from which passengers board complying with § 38.113(d) of this part. Existing cars designed and manufactured to be accessible in accordance with the Secretary of Transportation regulations implementing section 504 of the Rehabilitation Act of 1973 that were in effect before October 7, 1991, shall comply with § 38.125(a) of this part.

#### § 38.113 Doorways.

(a) *Clear width.* (1) At least one doorway, on each side of the car from which passengers board, of each car required to be accessible by § 38.111(a) and where the spaces required by § 38.111(d) of this part are located, and at least one adjacent doorway into coach passenger compartments shall have a minimum clear opening width of 32 inches.

(2) Doorways at ends of cars connecting two adjacent cars, to the maximum extent practicable in accordance with regulations issued under the Federal Railroad Safety Act of 1970 (49 CFR parts 229 and 231), shall have a clear opening width of 32 inches to permit wheelchair and mobility aid users to enter into a single-level dining car, if available.

(b) *Passageway.* Doorways required to be accessible by paragraph (a) of this section shall permit access by persons using mobility aids and shall have an unobstructed passageway at least 32 inches wide leading to an accessible sleeping compartment complying with § 38.127 of this part or seating locations complying with § 38.125(d) of this part. In cars where such doorways require passage through a vestibule, such vestibule shall have a minimum width of 42 inches. (see Fig. 4)

(c) *Signals.* If access to the platform close automatically or from a remote location, auditory and visual warning signals shall be provided to alert passengers of closing doors.

(d) *Coordination with boarding platforms.*—(1) *Requirements.* Cars which provide level-boarding in stations with high platforms shall be coordinated with the boarding platform or mini-high platform design such that the horizontal gap between a car at rest and the platform shall be no greater than 3 inches and the height of the car floor shall be within plus or minus ½ inch of the platform height. Vertical alignment may be accomplished by car air suspension, platform lifts or other devices, or any combination.

(2) *Exception.* New cars operating in existing stations may have a floor height within plus or minus 1½ inches of the platform height.

(3) *Exception.* Where platform setbacks do not allow the horizontal gap or vertical alignment specified in paragraph (d) (1) or (2), platform or portable lifts complying with § 38.125(b) of this part, or car or platform bridge plates, complying with § 38.125(c) of this part, may be provided.

(4) *Exception.* Retrofitted vehicles shall be coordinated with the platform in existing stations such that the horizontal gap shall be no greater than 4

inches and the height of the vehicle floor, under 50% passenger load, shall be within plus or minus 2 inches of the platform height.

(3) *Signage.* The International Symbol of Accessibility shall be displayed on the exterior of all doors complying with this section unless all cars and doors are accessible and are not marked by the access symbol (see fig. 6). Appropriate signage shall also indicate which accessible doors are adjacent to an accessible restroom, if applicable.

#### § 38.115 Interior circulation, handrails and stanchions.

(a) Where provided, handrails or stanchions within the passenger compartment shall be placed to permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a seating location, complying with § 38.125(d) of this part, from an accessible entrance. The diameter or width of the gripping surface of interior handrails and stanchions shall be 1½ inches to 1½ inches or shall provide an equivalent gripping surface. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface.

(b) Where provided, handrails and stanchions shall be sufficient to permit safe boarding, on-board circulation, seating and standing assistance, and alighting by persons with disabilities.

(c) At entrances equipped with steps, handrails or stanchions shall be provided in the entrance to the car in a configuration which allows passengers to grasp such assists from outside the car while starting to board, and to continue using such assists throughout the boarding process, to the extent permitted by part 231 of this title.

#### § 38.117 Floors, steps and thresholds.

(a) Floor surfaces on aisles, step treads and areas where wheelchair and mobility aid users are to be accommodated shall be slip-resistant.

(b) All step edges and thresholds shall have a band of color(s) running the full width of the step or threshold which contrasts from the step tread and riser or adjacent floor, either light-on-dark or dark-on-light.

#### § 38.119 Lighting.

(a) Any stepwell, or doorway with a lift, ramp or bridge plate, shall have, when the door is open, at least 2 foot-candles of illumination measured on the step tread, ramp, bridge plate or lift platform.

(b) The doorways of cars not operating at lighted station platforms

shall have outside lights which, when the door is open, provide at least 1 foot-candle of illumination on the station platform surface for a distance of 3 feet perpendicular to all points on the bottom step tread edge. Such lights shall be shielded to protect the eyes of entering and exiting passengers.

#### § 38.121 Public information system.

(a) Each car shall be equipped with a public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted.

(b) [Reserved].

#### § 38.123 Restrooms.

(a) If a restroom is provided for the general public, and an accessible restroom is required by § 38.111 (a) and (e) of this part, it shall be designed so as to allow a person using a wheelchair or mobility aid to enter and use such restroom as specified in paragraphs (a) (1) through (5) of this section.

(1) The minimum clear floor area shall be 35 inches by 60 inches. Permanently installed fixtures may overlap this area a maximum of 6 inches, if the lowest portion of the fixture is a minimum of 9 inches above the floor, and may overlap a maximum of 19 inches, if the lowest portion of the fixture is a minimum of 29 inches above the floor. Fixtures shall not interfere with access to and use of the water closet. Fold-down or retractable seats or shelves may overlap the clear floor space at a lower height provided they can be easily folded up or moved out of the way.

(2) The height of the water closet shall be 17 inches to 19 inches measured to the top of the toilet seat. Seats shall not be sprung to return to a lifted position.

(3) A grab bar at least 24 inches long shall be mounted behind the water closet, and a horizontal grab bar at least 40 inches long shall be mounted on at least one side wall, with one end not more than 12 inches from the back wall, at a height between 33 inches and 36 inches above the floor.

(4) Faucets and flush controls shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N). Controls for flush valves shall be mounted no more than 44 inches above the floor.

(5) Doorways on the end of the ~~enclosure opposite the water closet~~ shall have a minimum clear opening width of 32 inches. Doorways on the

side wall shall have a minimum clear opening width of 39 inches. Door latches and hardware shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist.

(b) Restrooms required to be accessible shall be in close proximity to at least one seating location for persons using mobility aids complying with § 38.125(d) of this part and shall be connected to such a space by an unobstructed path having a minimum width of 32 inches.

#### § 38.125 Mobility aid accessibility.

(a)(1) *General.* All intercity rail cars, other than level entry cars, required to be accessible by §§ 38.111 (a) and (e) of this subpart shall provide a level-change mechanism or boarding device (e.g., lift, ramp or bridge plate) complying with either paragraph (b) or (c) of this section and sufficient clearances to permit a wheelchair or other mobility aid user to reach a seating location complying with paragraph (d) of this section.

(2) *Exception.* If portable or platform lifts, ramps or bridge plates meeting the applicable requirements of this section are provided on station platforms or other stops required to be accessible, or mini-high platforms complying with § 38.113(d) are provided, the car is not required to be equipped with a car-borne device.

(b) *Car Lift—(1) Design load.* The design load of the lift shall be at least 600 pounds. Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Nonworking parts, such as platform, frame, and attachment hardware which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material.

(2) *Controls—(i) Requirements.* The controls shall be interlocked with the car brakes, propulsion system, or door, or shall provide other appropriate mechanisms or systems, to ensure that the car cannot be moved when the lift is not stowed and so the lift cannot be deployed unless the interlocks or systems are engaged. The lift shall deploy to all platform levels normally encountered in the operating environment. Where provided, each control for deploying, lowering, raising, and stowing the lift and lowering the roll-off barrier shall be of a monetary contact type requiring continuous

manipulation by the operator and shall not allow improper lift sequencing when the lift platform is occupied. The

controls shall allow reversal of the lift operation sequence, such as raising or lowering a platform that is part way down, without allowing an occupied platform to fold or retract into the stowed position.

(ii) *Exception.* Where physical or safety constraints prevent the deployment at some stops of a lift having its long dimension perpendicular to the car axis, the transportation entity may specify a lift which is designed to deploy with its long dimension parallel to the car axis and which pivots into or out of the car while occupied (i.e., "rotary lift"). The requirements of paragraph (b)(2)(i) of this section prohibiting the lift from being stowed while occupied shall not apply to a lift design of this type if the stowed position is within the passenger compartment and the lift is intended to be stowed while occupied.

(iii) *Exception.* The brake or propulsion system interlocks requirement does not apply to platform mounted or portable lifts provided that a mechanical, electrical or other system operates to ensure that cars do not move when the lift is in use.

(3) *Emergency operation.* The lift shall incorporate an emergency method of deploying, lowering to ground or station platform level with a lift occupant, and raising and stowing the empty lift if the power to the lift fails. No emergency method, manual or otherwise, shall be capable of being operated in a manner that could be hazardous to the lift occupant or to the operator when operated according to manufacturer's instructions, and shall not permit the platform to be stowed or folded when occupied, unless the lift is a rotary lift and is intended to be stowed while occupied.

(4) *Power or equipment failure.* Platforms stowed in a vertical position, and deployed platforms when occupied, shall have provisions to prevent their deploying, falling, or folding any faster than 12 inches/second or their dropping of an occupant in the event of a single failure of any load carrying component.

(5) *Platform barriers.* The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair or mobility aid from rolling off the lift during its operation. A movable barrier or inherent design feature shall prevent a wheelchair or mobility aid from rolling off the edge closest to the car until the lift is in its fully raised position. Each side of the lift platform which, in its raised position, extends beyond the car shall have a barrier a minimum 1½ inches high. Such barriers shall not interfere with



maneuvering into or out of the car. The leading-edge barrier (outer barrier) which functions as a loading ramp when the lift is at ground or station platform level, shall be sufficient when raised or closed, or a supplementary system shall be provided, to prevent a power wheelchair or mobility aid from riding over or defeating it. The outer barrier of the lift shall automatically rise or close, or a supplementary system shall automatically engage, and remain raised, closed, or engaged at all times that the lift platform is more than 3 inches above the station platform and the lift is occupied. Alternatively, a barrier or system may be raised, lowered, opened, closed, engaged or disengaged by the lift operator provided an interlock or inherent design feature prevents the lift from rising unless the barrier is raised or closed or the supplementary system is engaged.

(6) *Platform surface.* The lift platform surface shall be free of any protrusions over ¼ inch high and shall be slip resistant. The lift platform shall have a minimum clear width of 28½ inches at the platform, a minimum clear width of 30 inches measured from 2 inches above the lift platform surface to 30 inches above the surface, and a minimum clear length of 48 inches measured from 2 inches above the surface of the platform to 30 inches above the surface. (See Fig. 1.)

(7) *Platform gaps.* Any openings between the lift platform surface and the raised barriers shall not exceed ¾ inch wide. When the lift is at car floor height with the inner barrier (if applicable) down or retracted, gaps between the forward lift platform edge and car floor shall not exceed ½ inch horizontally and ¾ inch vertically.

(8) *Platform entrance ramp.* The entrance ramp, or loading-edge barrier used as a ramp, shall not exceed a slope of 1:8, when measured on level ground, for a maximum rise of 3 inches, and the transition from station platform to ramp may be vertical without edge treatment up to ¼ inch. Thresholds between ¼ inch and ½ inch high shall be beveled with a slope no greater than 1:2.

(9) *Platform deflection.* The lift platform (not including the entrance ramp) shall not deflect more than 3 degrees (exclusive of car roll) in any direction between its unloaded position and its position when loaded with 600 pounds applied through a 26 inch by 26 inch test pallet at the centroid of the lift platform.

(10) *Platform movement.* No part of the platform shall move at a rate exceeding 6 inches/second during lowering and lifting an occupant, and shall not exceed 12 inches/second

during deploying or stowing. This requirement does not apply to the deployment or stowage cycles of lifts that are manually deployed or stowed. The maximum platform horizontal and vertical acceleration when occupied shall be 0.3g.

(11) *Boarding direction.* The lift shall permit both inboard and outboard facing of wheelchairs and mobility aids.

(12) *Use by standees.* Lifts shall accommodate persons using walkers, crutches, canes or braces or who otherwise have difficulty using steps. The lift may be marked to indicate a preferred standing position.

(13) *Handrails.* Platforms on lifts shall be equipped with handrails, on two sides, which move in tandem with the lift, and which shall be graspable and provide support to standees throughout the entire lift operation. Handrails shall have a usable component at least 8 inches long with the lowest portion a minimum 30 inches above the platform and the highest portion a maximum 38 inches above the platform. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than ¼ inch. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the car.

(c) *Car ramp or bridge plate—(1) Design load.* Ramps or bridge plates 30 inches or longer shall support a load of 600 pounds, placed at the centroid of the ramp or bridge plate distributed over an area of 26 inches by 26 inches, with a safety factor of at least 3 based on the ultimate strength of the material. Ramps or bridge plates shorter than 30 inches shall support a load of 300 pounds.

(2) *Ramp surface.* The ramp or bridge plate surface shall be continuous and slip resistant, shall not have protrusions from the surface greater than ¼ inch high, shall have a clear width of 30 inches and shall accommodate both four-wheel and three-wheel mobility aids.

(3) *Ramp threshold.* The transition from station platform to the ramp or bridge plate and the transition from car floor to the ramp or bridge plate may be vertical without edge treatment up to ¼ inch. Changes in level between ¼ inch

and ½ inch shall be beveled with a slope no greater than 1:2.

(4) *Ramp barriers.* Each side of the ramp or bridge plate shall have barriers at least 2 inches high to prevent mobility aid wheels from slipping off.

(5) *Slope.* Ramps or bridge plates shall have the least slope practicable. If the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 3 inches or less above the station platform a maximum slope of 1:4 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 6 inches or less, but more than 3 inches, above the station platform a maximum slope of 1:6 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 9 inches or less, but more than 6 inches, above the station platform a maximum slope of 1:8 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is greater than 9 inches above the station platform a slope of 1:12 shall be achieved. Folding or telescoping ramps are permitted provided they meet all structural requirements of this section.

(6) *Attachment—(i) Requirement.* When in use for boarding or alighting, the ramp or bridge plate shall be attached to the vehicle, or otherwise prevented from moving such that it is not subject to displacement when loading or unloading a heavy power mobility aid and that any gaps between vehicle and ramp or bridge plate, and station platform and ramp or bridge plate, shall not exceed ¾ inch.

(ii) *Exception.* Ramps or bridge plates which are attached to, an deployed from, station platforms are permitted in lieu of car devices provided they meet the displacement requirements of paragraph (c)(6)(i) of this section.

(7) *Stowage.* A compartment, securement system, or other appropriate method shall be provided to ensure that stowed ramps or bridge plates, including portable ramps or bridge plates stowed in the passenger area, do not impinge on a passenger's wheelchair or mobility aid or pose any hazard to passengers in the event of a sudden stop.

(8) *Handrails.* If provided, handrails shall allow persons with disabilities to grasp them from outside the car while starting to board, and to continue to use them throughout the boarding process, and shall have the top between 30 inches and 38 inches above the ramp surface. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure.



The handrail shall have a cross-sectional diameter between 1 1/4 inches and 1 1/2 inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than 1/8 inch. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the car.

(d) *Seating*—(1) *Requirements*. All intercity rail cars required to be accessible by §§ 38.111 (a) and (e) of this subpart shall provide at least one, but not more than two, mobility aid seating location(s) complying with paragraph (d)(2) of this section; and at least one, but not more than two, seating location(s) complying with paragraph (d)(3) of this section which adjoin or overlap an accessible route with a minimum clear width of 32 inches.

(2) *Wheelchair or mobility aid spaces*. Spaces for persons who wish to remain in their wheelchairs or mobility aids shall have a minimum clear floor area 48 inches by 30 inches. Such space may have fold-down or removable seats for use when not occupied by a wheelchair or mobility aid user. (See Fig. 2.)

(3) *Other spaces*. Spaces for individuals who wish to transfer shall include a regular coach seat or dining car booth or table seat and space to fold and store the passenger's wheelchair.

#### § 38.127 Sleeping compartments.

(a) Sleeping compartments required to be accessible shall be designed so as to allow a person using a wheelchair or mobility aid to enter, maneuver within and approach and use each element within such compartment. (See Fig. 5.)

(b) Each accessible compartment shall contain a restroom complying with § 38.123(a) which can be entered directly from such compartment.

(c) Controls and operating mechanisms (e.g., heating and air conditioning controls, lighting controls, call buttons, electrical outlets, etc.) shall be mounted no more than 48 inches, and no less than 15 inches, above the floor and shall have a clear floor area directly in front a minimum of 30 inches by 48 inches. Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist.

### Subpart G—Over-the-Road Buses and Systems

#### § 38.151 General.

(a) New, used and remanufactured over-the-road buses, to be considered accessible by regulations in part 37 of this title, shall comply with this subpart.

(b) Over-the-road buses covered by § 37.7 (c) of this title shall comply with § 38.23 and this subpart.

#### § 38.153 Doors, steps and thresholds.

(a) Floor surfaces on aisles, step treads and areas where wheelchair and mobility aid users are to be accommodated shall be slip-resistant.

(b) All step edges shall have a band of color(s) running the full width of the step which contrasts from the step tread and riser, either dark-on-light or light-on-dark.

(c) To the maximum extent practicable, doors shall have a minimum clear width when open of 30 inches, but in no case less than 27 inches.

#### § 38.155 Interior circulation, handrails and stanchions.

(a) Handrails and stanchions shall be provided in the entrance to the vehicle in a configuration which allows passengers to grasp such assists from outside the vehicle while starting to board, and to continue using such handrails or stanchions throughout the boarding process. Handrails shall have a cross-sectional diameter between 1 1/4 inches and 1 1/2 inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than 1/8 inch. Handrails shall be placed to provide a minimum 1 1/2 inches knuckle clearance from the nearest adjacent surface. Where on-board fare collection devices are used, a horizontal passenger assist shall be located between boarding passengers and the fare collection device and shall prevent passengers from sustaining injuries on the fare collection device or windshield in the event of a sudden deceleration. Without restricting the vestibule space, the assist shall provide support for a boarding passenger from the door through the boarding procedure. Passengers shall be able to lean against the assist for security while paying fares.

(b) Where provided within passenger compartments, handrails or stanchions shall be sufficient to permit safe on-board circulation, seating and standing assistance, and alighting by persons with disabilities.

#### § 38.157 Lighting.

(a) Any stepwell or doorway immediately adjacent to the driver shall have, when the door is open, at least 2 foot-candles of illumination measured on the step tread.

(b) The vehicle doorway shall have outside light(s) which, when the door is open, provide at least 1 foot-candle of illumination on the street surface for a distance of 3 feet perpendicular to all

points on the bottom step tread outer edge. Such light(s) shall be located below window level and shielded to protect the eyes of entering and exiting passengers.

#### § 38.159 Mobility aid accessibility. (Reserved)

### Subpart H—Other Vehicles and Systems

#### § 38.171 General.

(a) New, used and remanufactured vehicles and conveyances for systems not covered by other subparts of this part, to be considered accessible by regulations in part 37 of this title shall comply with this subpart.

(b) If portions of the vehicle or conveyance are modified in a way that affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible vehicles be retrofitted with lifts, ramps or other boarding devices.

(c) Requirements for vehicles and systems not covered by this part shall be determined on a case-by-case basis by the Department of Transportation in consultation with the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).

#### § 38.173 Automated guideway transit vehicles and systems.

(a) Automated Guideway Transit (AGT) vehicles and systems, sometimes called "people movers", operated in airports and other areas where AGT vehicles travel at slow speed, shall comply with the provisions of § 38.53 (a) through (c), and §§ 38.55 through 38.61 of this part for rapid rail vehicles and systems.

(b) Where the vehicle covered by paragraph (a) will operate in an accessible station, the design of vehicles shall be coordinated with the boarding platform design such that the horizontal gap between a vehicle door at rest and the platform shall be no greater than 1 inch and the height of the vehicle floor shall be within plus or minus 1/2 inch of the platform height under all normal passenger load conditions. Vertical alignment may be accomplished by vehicle air suspension or other suitable means of meeting the requirement.

(c) In stations where open platforms are not protected by platform screens, a suitable device or system shall be provided to prevent, deter or warn individuals from stepping off the platform between cars. Acceptable devices include, but are not limited to,

pantograph gates, chains, motion detectors or other appropriate devices.

(d) Light rail and rapid rail ACT vehicles and systems shall comply with subparts D and C of this part, respectively.

**§ 38.175 High-speed rail cars, monorails and systems.**

(a) All cars for high-speed rail systems, including but not limited to those using "maglev" or high speed steel-wheel-on-steel rail technology, and monorail systems operating primarily on dedicated rail (i.e., not used by freight trains) or guideway, in which stations are constructed in accordance with Part 37, Subpart C of this title, shall be designed for high-platform, level boarding and shall comply with § 38.111(a) of this part for each type of car which is similar to intercity rail, §§ 38.111(d), 38.113 (a) through (c) and (e), 38.115 (a) and (b), 38.117 (a) and (b), 38.121 through 38.123, 38.125(d), and 38.127 (if applicable) of this part. The design of cars shall be coordinated with the boarding platform design such that

the horizontal gap between a car door at rest and the platform shall be no greater than 3 inches and the height of the car floor shall be within plus or minus  $\frac{1}{2}$  inch of the platform height under all normal passenger load conditions. Vertical alignment may be accomplished by car air suspension or other suitable means of meeting the requirement. All doorways shall have, when the door is open, at least 2 footcandles of illumination measured on the door threshold.

(b) All other high-speed rail cars shall comply with the similar provisions of subpart F of this part.

**§ 38.177 Ferries, excursion boats and other vessels. (Reserved)**

**§ 38.179 Trams, and similar vehicles, and systems**

(a) New and used trams consisting of a tractor unit, with or without passenger accommodations, and one or more passenger trailer units, including but not limited to vehicles providing shuttle service to remote parking areas,

between hotels and other public accommodations, and between and within amusement parks and other recreation areas, shall comply with this section. For purposes of determining applicability of 49 CFR 37.101, 37.103, or 37.105 the capacity of such a vehicle or "train" shall consist of the total combined seating capacity of all units, plus the driver, prior to any modification for accessibility.

(b) Each tractor unit which accommodates passengers and each trailer unit shall comply with § 38.25 and § 38.29 of this part. In addition, each such unit shall comply with § 38.23 (b) or (c) and shall provide at least one space for wheelchair or mobility aid users complying with § 38.23(d) of this part unless the complete operating unit consisting of tractor and one or more trailers can already accommodate at least two wheelchair or mobility aid users.

**Figures in Part 38**

**BILLING CODE 4910-62-M**

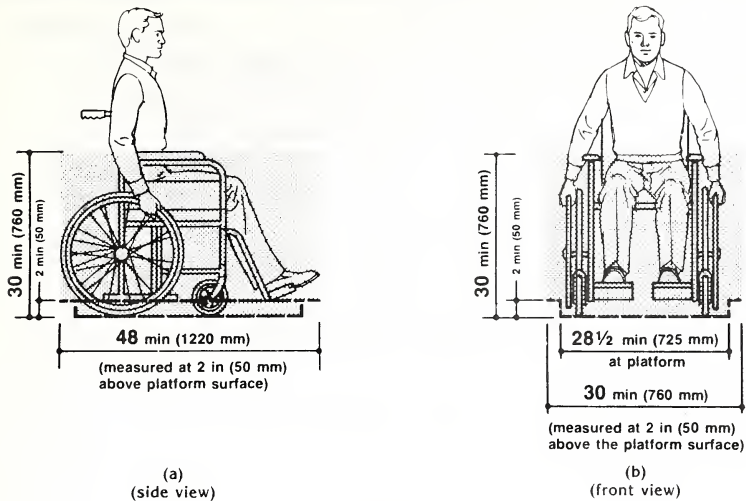


Fig. 1  
Wheelchair or Mobility Aid Envelope

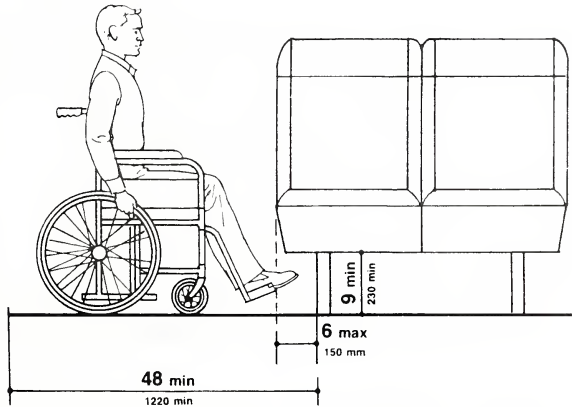


Fig. 2  
Toe Clearance Under a Seat

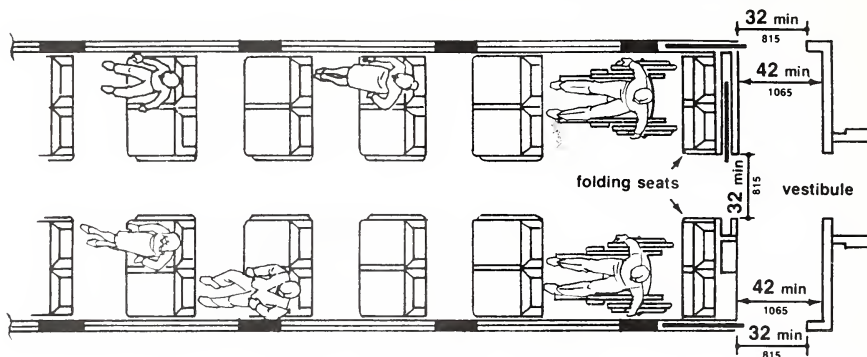


Fig. 3  
Commuter Rail Car (without restrooms)

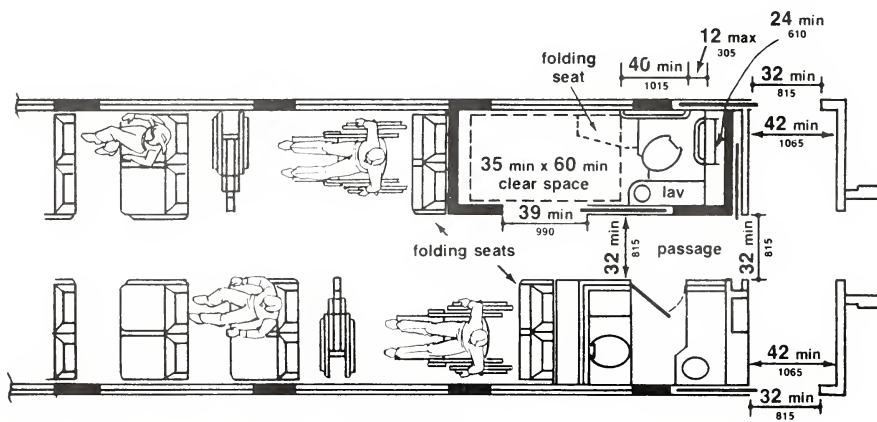


Fig. 4  
Intercity Rail Car (with accessible restroom)

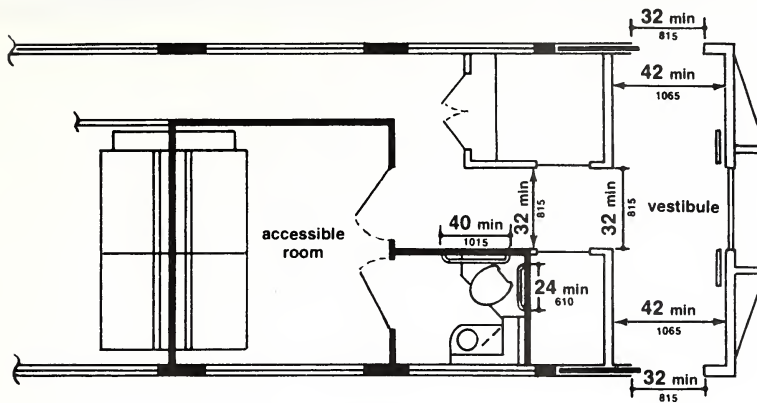
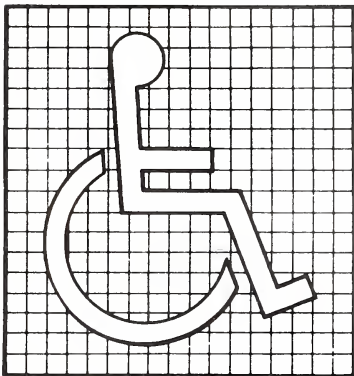


Fig. 5  
Intercity Rail Car (with accessible sleeping compartment)



(a)  
Proportions



(b)  
Display Conditions

Fig. 6  
International Symbol of Accessibility



### Appendix to Part 38: Guidance Material

This appendix contains materials of an advisory nature and provides additional information that should help the reader to understand the minimum requirements of the standards or to design vehicles for greater accessibility. Each entry is applicable to all subsets of this part except where noted. Nothing in this appendix shall in any way obviate any obligation to comply with the requirements of the standards themselves.

#### *I. Slip Resistant Surface—Aisles, Steps, Floor Areas Where People Walk, Floor Areas in Securement Locations, Lift Platforms, Ramps*

Slip resistance is based on the frictional force necessary to keep a shoe heel or clutch tip from slipping on a walking surface under conditions likely to be found on the surface. While the dynamic coefficient of friction during walking varies in a complex and non-uniform way, the static coefficient of friction, which can be measured in several ways, provides a close approximation of the slip resistance of a surface. Contrary to popular belief, some slippage is necessary to walking, especially for persons with restricted gait; a truly "non-slip" surface could not be negotiated.

The Occupational Safety and Health Administration recommends that walking surfaces have a static coefficient of friction of 0.5. A research project sponsored by the Architectural and Transportation Barriers Compliance Board (Access Board) conducted tests with persons with disabilities and concluded that a higher coefficient of friction was needed by such persons. A static coefficient of friction of 0.6 is recommended for steps, floors, and lift platforms and 0.8 for ramps.

It is recognized that the coefficient of friction varies considerably due to the presence of contaminants, water, floor finishes, and other factors not under the control of transit providers and may be difficult to measure. Nevertheless, many common materials suitable for flooring are now labeled with information on the static coefficient of friction. While it may not be possible to compare one product directly with another, or to guarantee a constant measure, transit operators or vehicle designers and manufacturers are encouraged to specify materials with appropriate values. As more products include information on slip resistance, improved uniformity in measurement and specification is likely. The Access Board's advisory guidelines on Slip Resistant Surfaces provides additional information on this subject.

#### *II. Color Contrast—Step Edges, Lift Platform Edges*

The material used to provide contrast should contrast by at least 70%. Contrast in percent is determined by:

$$\text{Contrast} = \frac{|B - B|}{B} \times 100$$

Where B = light reflectance value (LRV) of the lighter area

and B = light reflectance value (LRV) of the darker area.

Note that in any application both white and black are never absolute; thus, B never equals 100 and B is always greater than 0.

### *III. Handrails and Stanchions*

In addition to the requirements for handrails and stanchions for rapid, light, and commuter rail vehicles, consideration should be given to the proximity of handrails or stanchions to the area in which wheelchair or mobility aid users may position themselves. When identifying the clear floor space where a wheelchair or mobility aid user can be accommodated, it is suggested that at least one such area be adjacent or in close proximity to a handrail or stanchion. Of course, such a handrail or stanchion cannot encroach upon the required 32 inch width required for the doorway or the route leading to the clear floor space which must be at least 30 by 48 inches in size.

### *IV. Priority Seating Signs and Other Signage*

*A. Finish and Contrast.* The characters and background of signs should be eggshell, matte, or other non-gloss finish. An eggshell finish (11 to 19 degree gloss on 60 degree glossimeter) is recommended. Characters and symbols shall contrast with their background—either light characters on a dark background or dark characters on a light background. Research indicates that signs are more legible for persons with low vision when characters contrast with their background by at least 70 percent. Contrast in percent shall be determined by:

$$\text{Contrast} = \frac{|B - B|}{B} \times 100$$

Where B = light reflectance value (LRV) of the lighter area

and B = light reflectance value (LRV) of the darker area

Note that in any application both white and black are never absolute; thus, B never equals 100 and B is always greater than 0.

The greatest readability is usually achieved through the use of light-colored characters or symbols on a dark background.

*B. Destination and Route Signs.* [The following specifications, which are required for buses (§ 38.39), are recommended for other types of vehicles, particularly light rail vehicles, where appropriate.]

1. Where destination or route information is displayed on the exterior of a vehicle, each vehicle shall have illuminated signs on the front and boarding side of the vehicle.

2. Characters on signs required by paragraph IV.B.1 of this appendix shall have a width-to-height ratio between 3.5 and 1.1 and a stroke width-to-height ratio between 1.5 and 1.0, with a minimum character height (using an upper case "X") of 1 inch for signs on the boarding side and a minimum character height of 2 inches for front "headsigns," with "wide" spacing (generally, the space between letters shall be  $\frac{1}{4}$  the height of upper case letters), and shall contrast with the background, either dark-on-light or light-on-dark, or as recommended above.

*C. Designation of Accessible Vehicles.* The International Symbol of Accessibility should be displayed as shown in Figure 6.

### *V. Public Information Systems*

This section has been reserved and there currently is no requirement that vehicles be equipped with an information system which is capable of providing the same or

equivalent information to persons with hearing loss. While the Department assesses available and soon-to-be available technology during a study to be conducted during Fiscal Year 1992, entities are encouraged to employ whatever services, signage or alternative systems or devices that provide equivalent access and are available. Two possible types of devices are visual display systems and listening systems. However, it should be noted that while visual display systems accommodate persons who are deaf or are hearing impaired, assistive listening systems aid only those with a partial loss of hearing.

#### *A. Visual Display Systems.*

Announcements may be provided in a visual format by the use of electronic message boards or video monitors.

Electronic message boards using a light emitting diode (LED) or "flip-dot" display are currently provided in some transit stations and terminals and may be usable in vehicles. These devices may be used to provide real time or pre-programmed messages; however, real time message displays require the availability of an employee for keyboard entry of the information to be announced.

Video monitor systems, such as visual paging systems provided in some airports (e.g., Baltimore-Washington International Airport), are another alternative. The Architectural and Transportation Barriers Compliance Board (Access Board) can provide technical assistance and information on these systems ("Airport TDD Access: Two Case Studies," (1990)).

*B. Assistive Listening Systems.* Assistive listening systems (ALS) are intended to augment standard public address and audio systems by providing signals which can be received directly by persons with special receivers or their own hearing aids and which eliminate or filter background noise. Magnetic induction loops, infra-red and radio frequency systems are types of listening systems which are appropriate for various applications.

An assistive listening system appropriate for transit vehicles, where a group of persons or where the specific individuals are not known in advance, may be different from the system appropriate for a particular individual provided as an auxiliary aid or as part of a reasonable accommodation. The appropriate device for an individual is the type that individual can use, whereas the appropriate system for a station or vehicle will necessarily be geared toward the "average" or aggregate needs of various individuals. Earphone jacks with variable volume controls can benefit only people who have slight hearing loss and do not help people who use hearing aids. At the present time, magnetic induction loops are the most feasible type of listening system for people who use hearing aids equipped with "T-coils," but people without hearing aids or those with hearing aids not equipped with inductive pick-ups cannot use them without special receivers. Radio frequency systems can be extremely effective and inexpensive. People without hearing aids can use them, but people with hearing aids need a special receiver to use them as they are presently



designed. If hearing aids had a jack to allow a by-pass of microphones, then radio frequency systems would be suitable for people with and without hearing aids. Some listening systems may be subject to interference from other equipment and feedback from hearing aids of people who are using the systems. Such interference can be controlled by careful engineering design that anticipates feedback sources in the surrounding area.

The Architectural and Transportation Barriers Compliance Board (Access Board) has published a pamphlet on Assistive Listening Systems which lists demonstration centers across the country where technical assistance can be obtained in selecting and installing appropriate systems. The State of New York has also adopted a detailed technical specification which may be useful.

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